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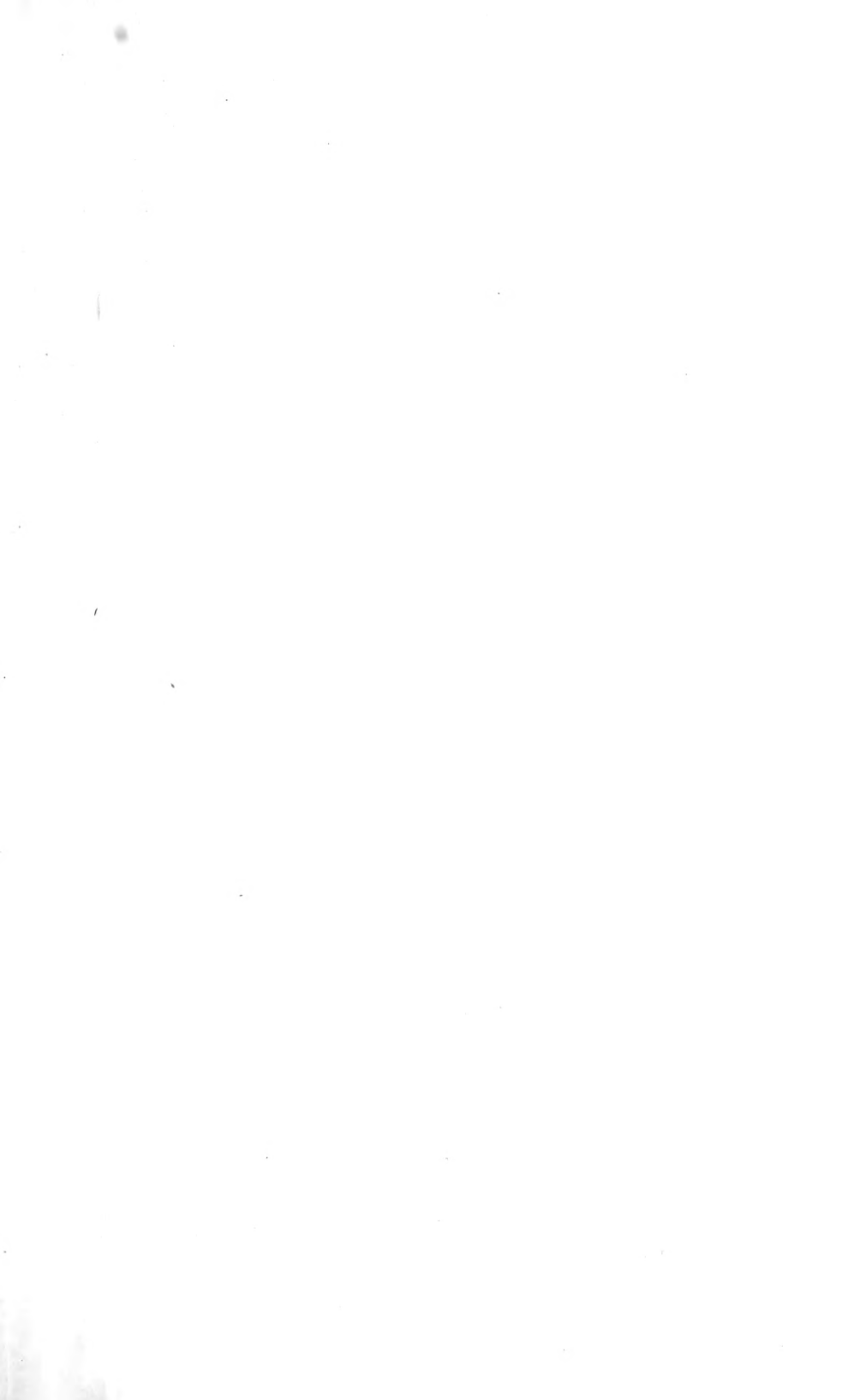


*Manual of*  
**WORK GARMENT**  
*Manufacture*

How to  
improve  
quality  
*and* reduce  
costs

**UNION SPECIAL MACHINE COMPANY**  
CHICAGO, U.S.A.

SEP -2 21









In presenting this loose leaf reference booklet we do so with the assurance that our readers will realize its highly technical value.

The Union Special Machine Company prepared this work as a service to its customers, and it is evident that it could not be accomplished without research and mechanical work involving great expense.

In order to make this service permanent we have made provision for the addition of loose pages which will be sent to the holders of this booklet from time to time as additional data is compiled. The value of this service will be readily seen for it will positively keep the reader informed of the new machines and attachments which this company will introduce to the field. Also the new methods of manufacturing work garments and modern designs of the work garment itself.

May we not suggest that this booklet be retained to enable us to keep you thoroughly informed of the very latest developments in the garment industry?

## UNION SPECIAL MACHINE COMPANY

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CHICAGO, ILL.

New York, N. Y., 65 Bleecker Street  
 Philadelphia, Pa., 12th & Arch Streets  
 Boston, Mass., 144 Kingston Street  
 Cincinnati, Ohio, 229 East 6th Street  
 St. Louis, Mo., 1127 Pine Street  
 Utica, N. Y., 9 Blandina Street  
 Rochester, N. Y., 36 St. Paul Street  
 Amsterdam, N. Y., 13 Railroad Street  
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 Minneapolis, Minn., 324 South Fourth Avenue  
 Johnson City, N. Y., 16 North Broad Street  
 San Francisco, Calif., 682 Mission Street

## UNION SPECIAL MACHINE CORPORATION OF AMERICA

87 Boulevard Sebastopol

PARIS, FRANCE

## UNION SPECIAL MACHINE CO. OF CANADA, LTD.

64 Temperance Street

TORONTO, ONTARIO, CANADA



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**Union Special Machine Co.**

Manufacturers of

**Power Sewing Machines**

**Sewing Room Engineers**

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**“Watch Your Stitch!”**

**“See That It Is Double Locked”**

## Introduction

In comparing the overall and other work garments of today with similar apparel of the past, it is obvious that the demands of the American workman for quality, fit, and attractiveness have been largely fulfilled. The men on the farms, in the engine cabs, in the shops and engaged in building construction are now wearing the product of efficiently conducted factories, where every conceivable means known is employed to turn out garments that satisfy.

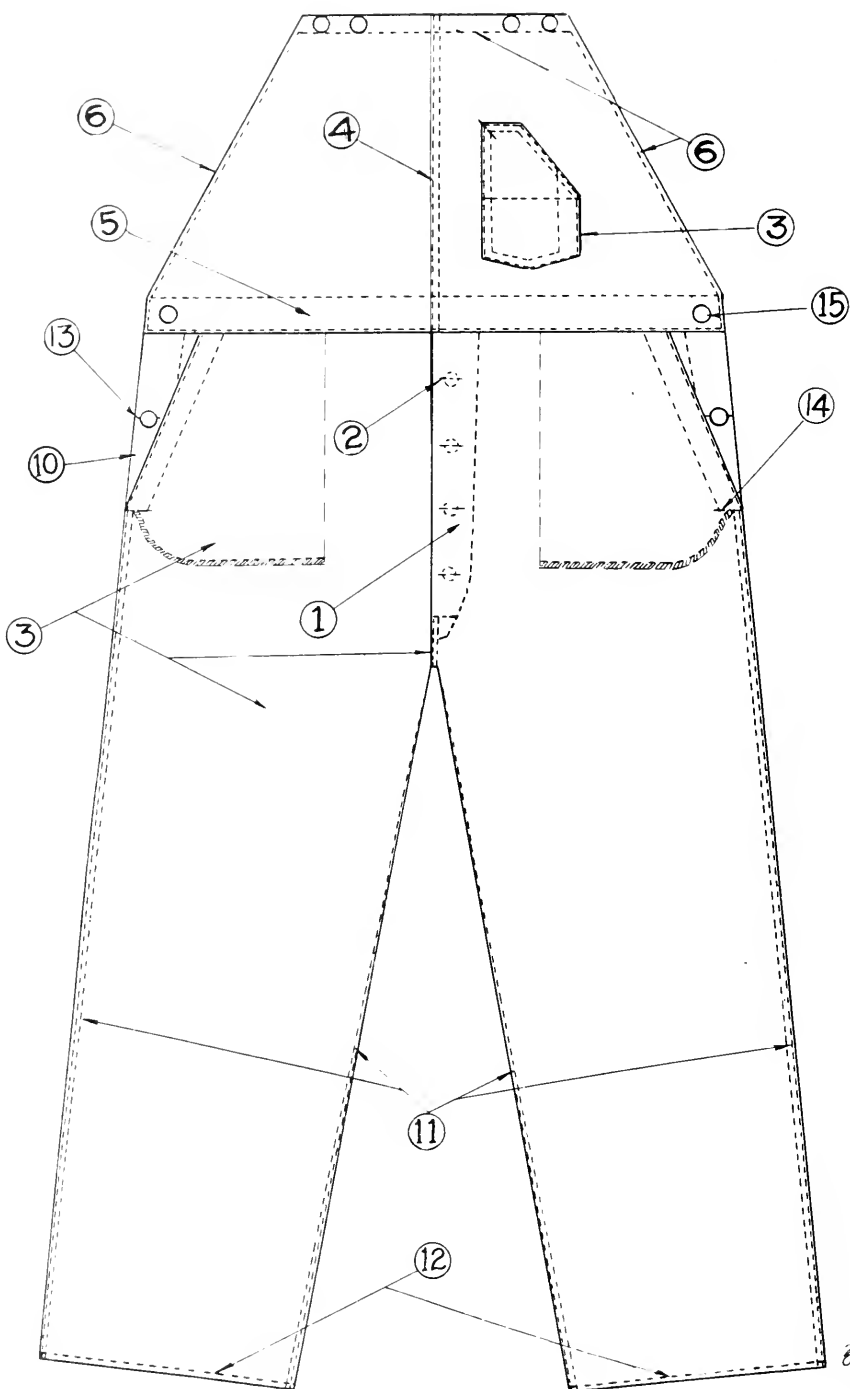
That the sewing machine deserves credit for a good portion of this goes without saying, but it is generally conceded that Union Special machines revolutionized the overall industry by doing away with the old bundle system. This enables each operator to remain continuously on one operation, resulting in greater and better production. The use of Union Special sewing machines has increased rapidly and many machines that were designed to meet special operations have finally become perfected and standardized until today a list of sewing machines stands ready to fill the overall manufacturer's every want for seams of strength and elasticity.

In Union Special machines, the thread goes into the seam with all its strength and luster unimpaired. No chafing of the thread by passing many times through the eye of the needle before being finally drawn into the goods as is the case with all shuttle stitch machines.

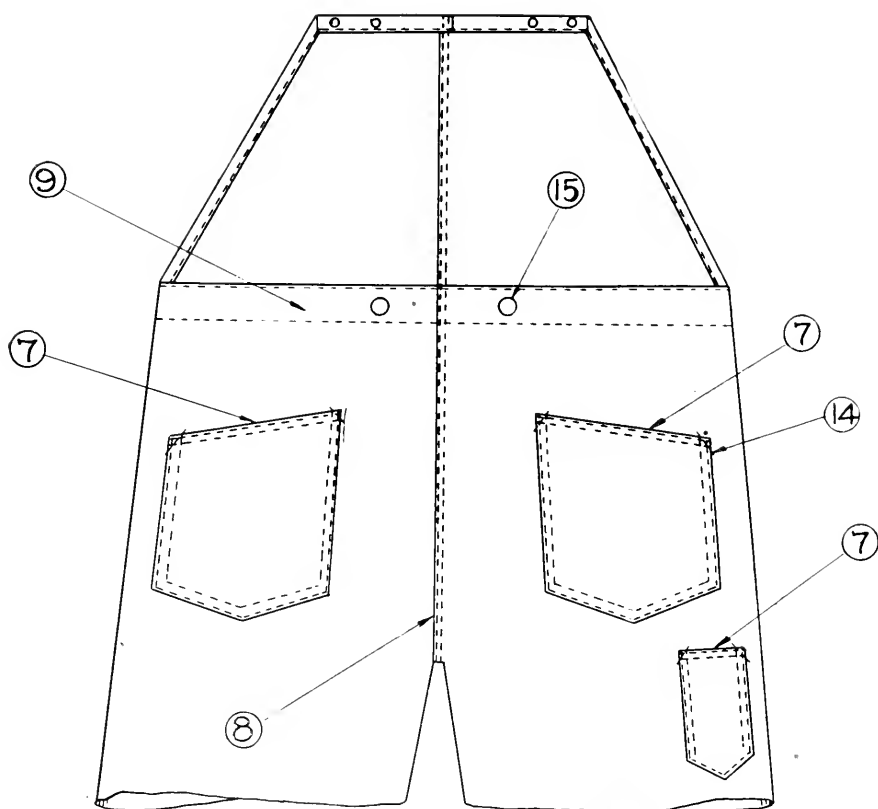
Users of Union Special machines realize their characteristic high speed and many other points in their favor set forth in this booklet.

It is our intention to give a reliable treatise on the proper method to manufacture overalls and allied garments, giving the best machine specifications for each operation, whether Union Special make or not.

The succeeding pages should be of vital interest to anyone engaged in the manufacture of work garments or to anyone contemplating entering this industry.

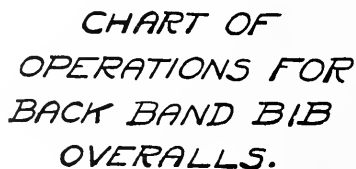


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## List of Operations on Back Band Bib Overalls

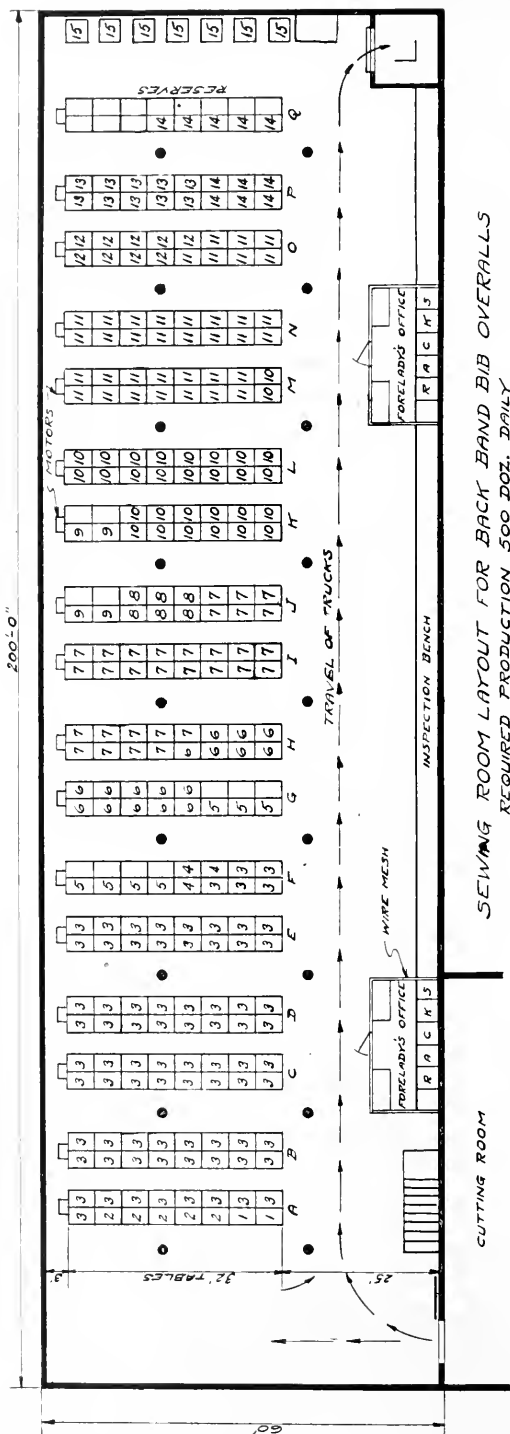
- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Making fly.</li> <li>2. Button-holes in fly.</li> <li>3. Making front.</li> <li>4. Felling bib seam.</li> <li>5. Sewing on front band and attaching bibs.</li> <li>6. Hemming bib.</li> <li>7. Stitching hip and rule pockets to back.</li> <li>8. Felling back seam.</li> <li>9. Sewing on back band.</li> </ol> | <ol style="list-style-type: none"> <li>10. Facing sides and attaching ticket.</li> <li>11. Felling inside and outside seams of legs.</li> <li>12. Hemming bottoms.</li> <li>13. Sewing button-holes.</li> <li>14. Tacking.</li> <li>15. Attaching buttons.</li> <li>16. Trimming loose threads.</li> <li>17. Final inspection and folding.</li> </ol> |
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A High Grade Overall



UNION SPECIAL MACHINE CO.  
CHICAGO, ILL., U.S.A.  
MAR. 29, 1921

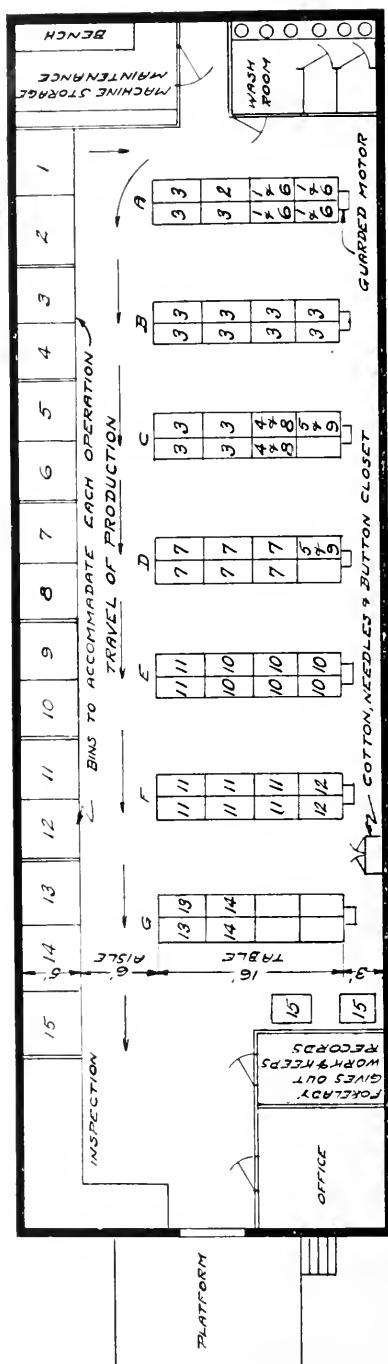
## Description of Layout For Back Band Overalls

**Required Production—500 Dozen Daily**

**Actual Production—630 Dozen Daily**

**8 hour day.**

Table	Operation Number	Description of Operation	Machines Recommended	Av. Daily Production Each Mach.	Number of Machines
A	1	Making fly	Union Special 6500	320 doz	2
A	2	Fly button-holes	Button-hole	125 "	5
A,B,C, D,E,F,	3	Making fronts	Shuttle Stitch	8 "	78
F	4	Felling Bib Seam	Union Special 12100, 31500 7500, 17100	210 "	3
F,G	5	Stitching on front band and joining bibs	Union Special 16500, 16800	90 "	7
G,H,	6	Hemming bib	Shuttle Stitch	37 "	17
H,I,J	7	Stitching on 2 hip pockets and 1 rule pocket	Union Special 8300	20 "	31
J	8	Felling back seam	Union Special 7500, 12100, 17100, 31500	105 "	6
J,K	9	Stitching on Back Band	Union Special 16500, 16800	180 "	4
K,L,M	10	Hemming sides and sewing on ticket	Shuttle Stitch	20 "	30
M,N,O	11	Felling inside and outside leg	Union Special 12100, 31500	17 "	37
O	12	Hemming leg bottoms	Union Special 11500	70 "	9
P	13	Sewing button-holes	Button-hole	63 "	10
P,Q	14	Tacking	Tacking	57 "	11
	15	Attaching buttons	Button machine	90 "	7



# SEWING ROOM LAYOUT FOR BACK BAND BIB OVERALLS

REQUIRED PRODUCTION 100 DOZ. DAILY  
ACTUAL " 125 "

SIZE OF ROOM 100'x30'x10'

UNION SPECIAL MACHINE CO.  
CHICAGO, U.S.A.

84.5 5-15-21. 82C  
5/26-71

## Description of Layout for Back Band Bib Overalls

**Required Production—100 doz. Daily**

**Actual Production—125 doz. Daily**

**8 Hour Day.**

Table	Operation	Description	Machine Used
A	1 and 6	Making fly	Union Special Class 6500
		Hemming bib	Union Special Class 6500
A	2	Fly button-holes	Button-hole Machine
A,B,C	3	Making fronts	Shuttle stitch machine
C	4 and 8	Felling bib seam	Union Special Classes 12100,
		Felling back	31500, 7500, and 17100.
C,D	5 and 9	Stitching on front band	Union Special 16500, 16800,
		Stitching on back band	Union Special 16500, 16800
D	7	Stitching on hip and rule pockets	Union Special 8300
E	10	Hemming side and sewing ticket	Shuttle Stitch
E,F	11	Felling inside and outside seam	Union Special Classes 12100, and 31500.
F	12	Hemming leg bottoms	Union Special 11500
G	13	Sewing button-holes	Button-hole
G	14	Tacking	Tacking
	15	Attaching buttons	Button machine.

### GENERAL DESCRIPTION

Due to the small capacity of this sewing room, the layout differs greatly from that of larger production, in that there is need for doubling up on many operations.

When one machine working on a certain operation can produce the required amount in less than a day, it is used for an operation that requires the same machine. In this manner no machine is allowed to stand idle.

This layout is intended to show the contractors' sewing room, i. e., one where the work is sent already cut, and it is only a question of sewing and returning the work to the manufacturer.

# The Sewing Room of an Overall Factory

## The Layout

The reader will find as he studies the model layout on page 12 that it is planned from the chart of operations on page 10, and that this chart is, of course, the result of a thorough analysis of the overall itself, see page 8. Thus, as a result of an analytical study of the product, we arrive at the ideal layout of tables and machines to give maximum production with as little overhead expense as possible. In a sewing room for the production we show here, hundreds of operators are found, as many as 78 working on the same operation. These operators with their machines, are so placed that the first operation begins nearest the source of the material to be worked upon, the cutting room; the second operation is done on the adjacent tables, the third next, and so on, until the overall emerges from the sewing room ready for shipment.

The layout for a sewing room for overalls shown on page 12 indicates conservation of floor space, and the retracing of operations is reduced to the minimum.

Manufacturers differ as to the size of a bundle in the making of overalls, some contending that a greater production can be obtained by having as many as 5 dozen to a bundle. However, this matter depends entirely on the system employed although as a rule the bundle does not consist of more than one or two dozen.

There are two systems in general use for moving work through the sewing room: The rack system and the truck system, or the combination of these systems.

## Truck System

The truck system, indicated in the layout on page 12, is considered by some the ideal one. These trucks travel from the cutting room with the bundles and stop at the first table where operators proceed with the first operation, being careful to lay the parts in the bundle when through sewing, so that the next operator will automatically get the parts in order. The careful arranging of parts in the bundle after each operation is important. It has meant in many cases a 5% increase in production.

After the first operation is accomplished the bundles are placed on the truck and it proceeds to the next operator.

In other words, these trucks might be imagined as a man going down the room, stopping at each operation, getting the operation done, proceeding to the next operation, and continuing in this way until he leaves the room with the finished overalls.

In case congestion occurs at any operation, due to slackening up of the operator, this is immediately noticed by the man in charge of the trucks and he dispatches his men to that spot where they assist the operators in handling the parts, thus relieving the congestion. Each truck is numbered and a schedule is kept on a blackboard by the man in charge of the trucks.

## Rack System

The rack system consists of the use of wooden racks or bins located conveniently in relation to the sewing tables. These racks located as shown in the layout for 100 dozen on page 14 will permit the bundles automatically to work their way to the stock room. Upon completion of each operation the work is deposited in a bin nearer the finishing end of the sewing room, each bin being numbered to correspond to the operation to be performed next.

Thus the first bin will contain bundles for the first operation which, after completion of this first operation, are deposited in the next bin or No. 2.

It will be obvious that in this manner each bin should contain about the same number of bundles, and this will permit the forelady to ascertain where any slackening up on the operator's part occurs.

The first bin should be emptied of the entire cut before the new cut is delivered as this tends to balance the sizes coming through the sewing room, giving all operators a variety instead of allowing some operators to pick out all the smallest sizes.

The bins should be arranged to accommodate maximum production of the total number of machines.

With the bins arranged as shown on page 14 and where bundles contain only one dozen, an opportunity is afforded the operator to get sufficient exercise by walking to the bin after each operation. This periodical walk keeps her freshened for the entire working period.

## Sewing Rooms On Separate Floors

Where the sewing room is located on separate floors the work is started on the top floor, the cutting room being adjacent. When the last operation on each floor is accomplished, the bundles are sent through a chute into the first bin on the floor below. An electric bell notifies the room above to send down another cut.

In this way the elevator is used only for bringing up raw material, all work in process being brought back to stock room by means of chutes. Where sewing rooms are located on floors above each other, trucks are hardly advisable. The truck system works best where the sewing room is on one large floor, and where a large production is required.

## Coupon Cost Method

The most simple and efficient method for keeping costs in the garment industry is known as the Coupon System.

The accompanying illustration shows a typical tag with its detachable coupons, indicated by the perforated lines.

In the tag shown, all operations are accounted for but in many cases more than one tag with its operations are used for each complete bundle.

The first operator sews the tag which is made of fairly tough paper, with one line of stitching to a conspicuous place on the first garment of the bundle, and then proceeds with the first operation on the entire bundle. After completion of this operation the operator tears off a coupon and inserts her clock number in the space provided for it.

The operator is paid weekly and only upon presentation of these coupons. To provide a safe place for these coupons, a book of about four pages is used by each operator. This book is approximately 10 x 4 inches and the pages are provided with slits or pockets for the orderly insertion of coupons.

All operations are done at the rate of a certain predetermined amount. Therefore it is obvious that the labor cost of the bundle, which each tag and its coupons represents, can be very easily ascertained by merely adding the costs of each operation on the bundle.

When all the operations are completed, the coupons, although detached, can easily be identified with the remaining stub by the operation number, cut number, bundle number and operator's number, and therefore there is little chance of the existence of more coupons than bundles, as this would be very readily detected in the cost department.

From the above, it will be seen that the coupon tag serves both employer and employee, the former by a rigid check on all work performed, the amount to be paid for labor, checked by production, and the operator has a coupon for every operation performed on a bundle.

Some manufacturers use a card with smaller coupons to be clipped off by use of scissors, and instead of stitching tag to garment, it is often attached to the bundle in the cutting room by looping on the same string that ties the bundle.



XYZ COMPANY	
OPERATOR'S NUMBER MUST APPEAR ON COUPON & STUB	
CUT NO. 34	BUNDLE NO. 21
SIZE 36-34	LOT NO. 500.
17. OPR. NO. 49	16. OPR. NO. 36
15. " " 48	14. " " 50
13. " " 20	12. " " 87
11. " " 15	10. " " 53
9. " " 70	8. " " 34
7. " " 44	6. " " 1
5. " " 16	4. " " 23
3. " " 10	2. " " 40
(17) INSPECT & FOLD CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 49	(16) TRIM THREADS CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 36
(15) BUTTONS ON. CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 98	(14) TACKING CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 50
(13) BUTTON HOLES CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 20	(12) HEM BOTTOMS CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 87
(11) FELL IN & OUT SEAMS CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 15	(10) FACE SIDE TICKET ON CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 53
(9) BACK BAND CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 70	(8) FELL BACK SEAM CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 34
(7) HIP & RULE POCKETS CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 44	(6) HEM BIB CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 1
(5) FRONT BAND CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 16	(4) FELL BIB SEAM CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 23
(3) MAKING FRONT CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 10	(2) FLY BUTTON HOLES CUT NO. 34 BUNDLE NO. 21 OP'R. NO. 40

## General Notes on Equipment For Sewing Room

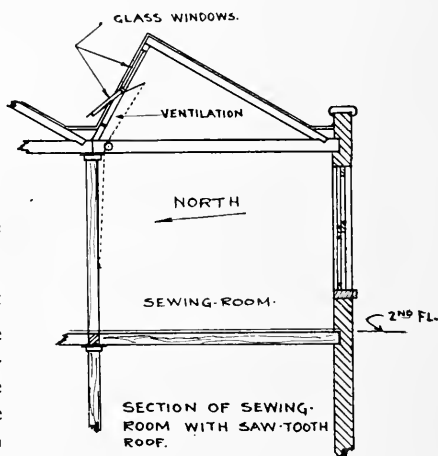
The sewing room is often located on the top floor of the building with the cutting room adjacent, for both require the best of light.

If a new building is contemplated, it is advised that a "saw-tooth" roof construction be incorporated in the plans. This type of roof has two features that are a positive stimulant for greater production: namely, proper ventilation and as much daylight as possible. As shown in the figure, this is a very simple construction and while it costs more than a flat roof, this item is compensated for in the long run by less costly light bills, good air, etc. Incidentally, the currents of air have a tendency to go upward, thus carrying the fine lint off the floor and also away from the intricate mechanism of the machines.

### Illumination

As shown in the figure the daylight comes from the north and thus prevents the sunlight from shining in the eyes of the operators, an advantage over the ordinary skylight. However, skylights installed in an old building are the proper thing inasmuch as to install a saw-tooth roof would mean an entire new roof. The saw-tooth roof is recommended for a new building only.

Artificial illumination is, of course, necessary at times and the ideal arrangement is the overhead indirect lighting with white walls, etc. Where this cannot be had, it is recommended that each operator have an individual adjustable light.



### Welfare

It is not intended to go into the matter of welfare to any great length here but it is certain that rest rooms in a large factory employing young women are necessary and likewise the first aid station with a nurse in attendance. This always inspires confidence in the employees. For those employees who cannot reach their homes for luncheon, a cafeteria will be found advantageous.

## Description of Operations and Equipment for Back Band Bib Overalls

### Making Overall Fly (Operation No. 1)

**Standard Equipment:** UNION SPECIAL Machine Style 6500 E.  
Folder, 23182 D.

Presser Foot, 6427 B.

Feed Dog, 9705.

Throat Plate, 9724 B.

Thread recommended, 3 cord 24 glazed in needle; 3 cord 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 40 dozen.

### Fly Button Holes (Operation No. 2)

**Standard Equipment:** Button-hole Machine.

Average production per hour, 15 dozen.

### Making Fronts For Bib Overalls (Operation No. 3)

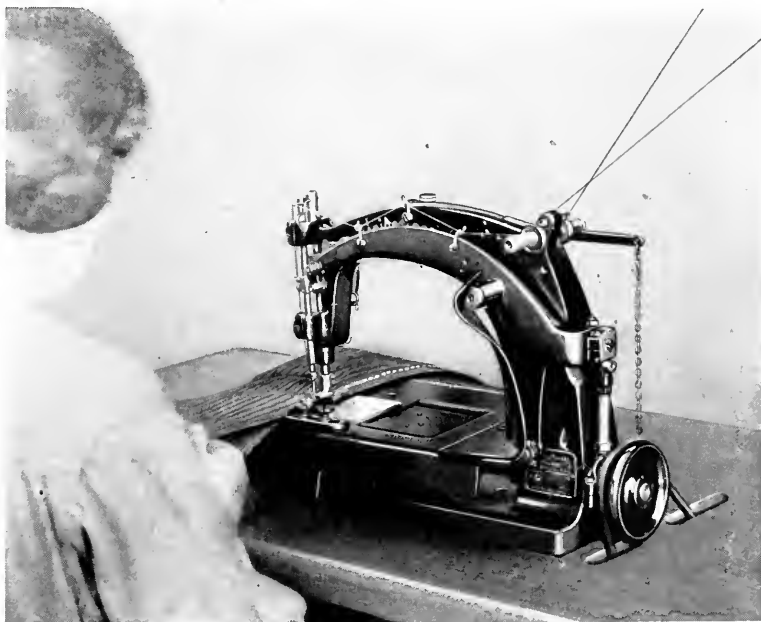
This operation consists of making and closing front pockets, combination pocket on bib, make and join fork to fly; stitch box at top end of fly, make and sew in watch pockets, joining fronts together.

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

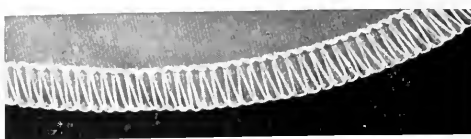
Thread Recommended, 3 cord, 24 glazed in needle, 3 cord, 24 soft in bobbin.

Number of stitches to the inch, 9.

Average production per hour, 1 dozen.



Union Special Machine 6500



Note: In case it is desired to finish pockets in the manner shown above, this is done in a separate operation.

**Standard Equipment:** UNION SPECIAL Machine Style 15400 Q.

Presser Foot, 15427 G.

Feed Dog, 15405 W.

Throat Plate, 15424 J.

Thread recommended, 3 cord 60 silk finish in needle, 2 cord 50 soft finish in looper.

Number of stitches to the inch, 11.

Average production per hour, 9 dozen.



**Union Special Machine 15400 Q**

### **Felling Bibs (Operation No. 4)**

This operation consists of felling and stitching together the two halves of the bib.

The following helpful hints are recommended as an aid to the operator:

To obtain the highest possible production on felling bibs for overalls, it is necessary to learn to hold the work properly. The edges to be felled should be held in the left hand, the under ply between the second finger and the thumb, allowing the edge to be even with the top of the second finger, and to slide between the finger and the thumb, the finger holding the material against the under scroll of the folder, and at the same time pressing the material against the fold-

er, so as to retard the material. The upper ply is held between the first and second fingers of the left hand and should be allowed to slide through the fingers freely.

**Standard Equipment:** UNION SPECIAL Machine Style 12100 B-5.

Folder, 601-5-7-64.

Feed Dog, 12105 E-5.

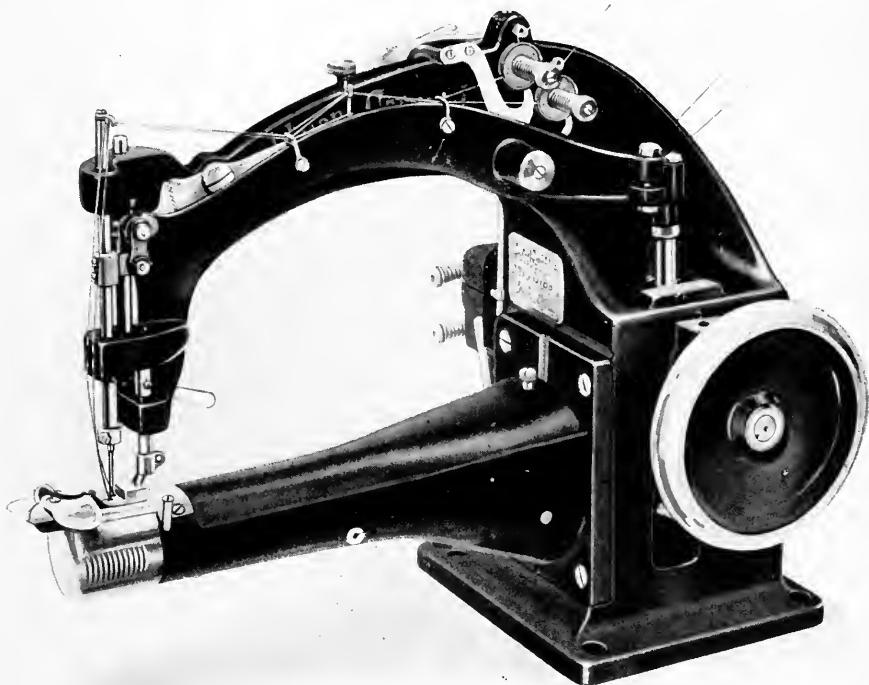
Presser Foot, 12120 E-5.

Throat Plate, 12124 E-5.

Thread recommended, 3 cord, 24 glazed in needle; 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 26 dozen.



### Union Special Machine Class 12100

Note: Felling the bib seam can also be done very efficiently on a Flat Bed machine, giving the same high grade results.

**Standard Equipment:** UNION SPECIAL Two Needle Machine Style 7500 B-5.

See page 30 for illustration of machine.

Folder, 600-5-7-64.

Feed Dog, 7505.

Presser Foot, 198 A-5.

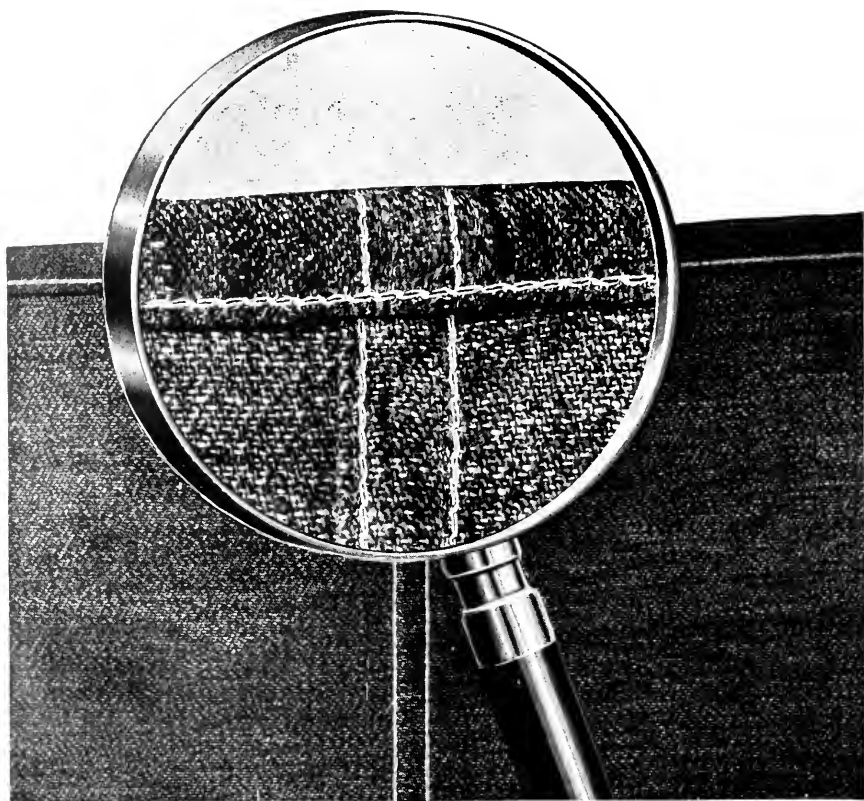
Throat Plate, 7524 B-5.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 26 dozen.

Note: 4 and 4½ gauge can also be had if desired. See Standard Table on page 45.



**Felled Seam as Seen Through Magnifying Glass**

## **Stitching on Front Band and Joining Bib to Overall (Operation No. 5)**

This operation consists of stitching a band to the front of overall and at the same time attaching bib.

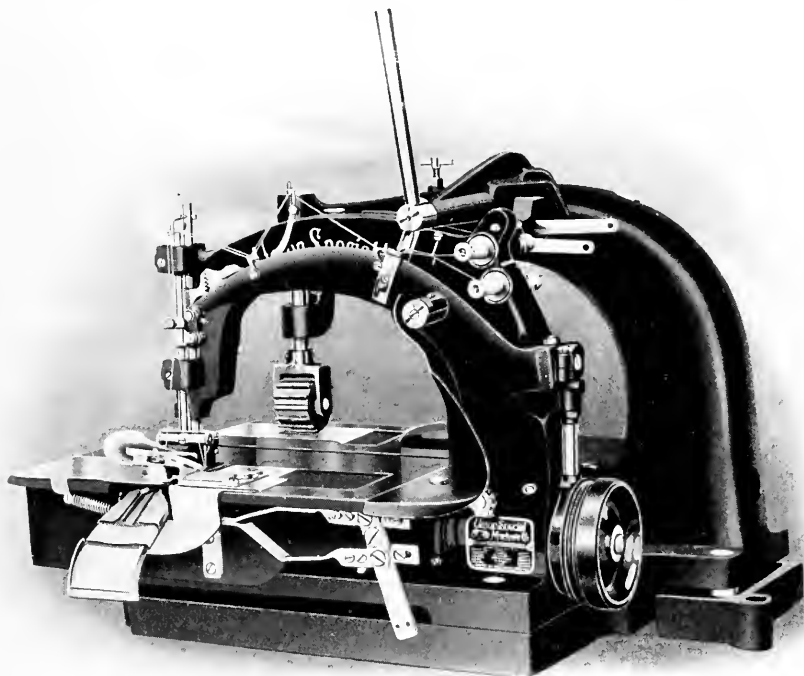
The following helpful hints are recommended as an aid to the operator:

The collapsible folder is used to prevent bulkiness at the sides of overalls and instead of turning in both the side of the bib and the end of the band, the operation should be done as follows:

In starting the work at the side, lower folding device is collapsed or drawn together sufficiently to remove the edges of band passing through the folding device from a point outside of the needles to a point inside the needles; thus preventing the needle from stitching the lower strap until a point is reached opposite the edge of the overall.

This leaves stitched only the edge of the bib which protrudes beyond the side of the overall and which is necessary for finishing purposes. That portion of the strap beyond the sides of the overall can then be cut with a pair of shears, leaving only the side of the bib to

finish with machines, and only six thicknesses of material at the in-turned portion of the bib to be stitched through instead of twelve were this not done, making it easy to button-hole. The same thing occurs on the opposite side. When the operator reaches the edge of the overall, she collapses the folder by pressing the knee treadle which controls the collapsing mechanism removing the edge of the band from the path of the needles, and then continues the sewing operation to the extreme side of the overall. The machine is not stopped or slowed down, as the collapsing is done without loss of time.



### Style 16500 B with Puller Fitted for Joining Bibs to Overalls

**Standard Equipment:** UNION SPECIAL Machine Style 16500 B-80 gauge equipped with pulling mechanism.

Note: If desired, 88 and 96 gauge machines and parts can be had.

Collapsible Folder for turning edge of band, 23324 K-80.

Folder for turning edge of bib, 23325 E-96-3-16.

Presser Foot, 16220 B-80.

Guide for body of overall, 23326 A.

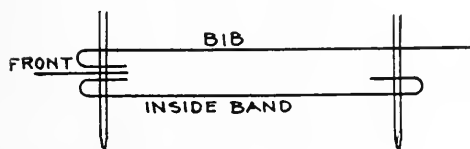
Feed Dog, 16505-88.

Throat Plate, 16224-80.

Thread recommended, 3  
cord, 24 glazed in needle, 3  
cord, 36 soft in looper.

Number of stitches to the  
inch, 9.

Average production per  
hour, 11 dozen.





## Sewing Front Band and Attaching bibs to Overalls with four rows of stitching

The Union Special Machine Company has perfected a machine to do this operation with four needles.

The above photograph shows a garment with band and bib attached in this manner.

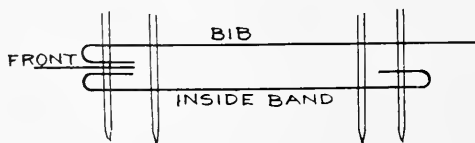
**Standard Equipment:** UNION SPECIAL Machine Style 16800 Z-4-16-64-16, equipped with pulling mechanism.

Collapsible Folder for turning edge of band, 23324 K-96.

Folder for turning edge of bib, 23325 E-96-3-16.

Presser Foot, 16834 D-16-64-16.

Guide for body of overall, 23326 A.



Feed Dog, 1 No. 16805 B. 2 No. 16805 D-16.

Throat Plate, 16844 K-16-64-16.

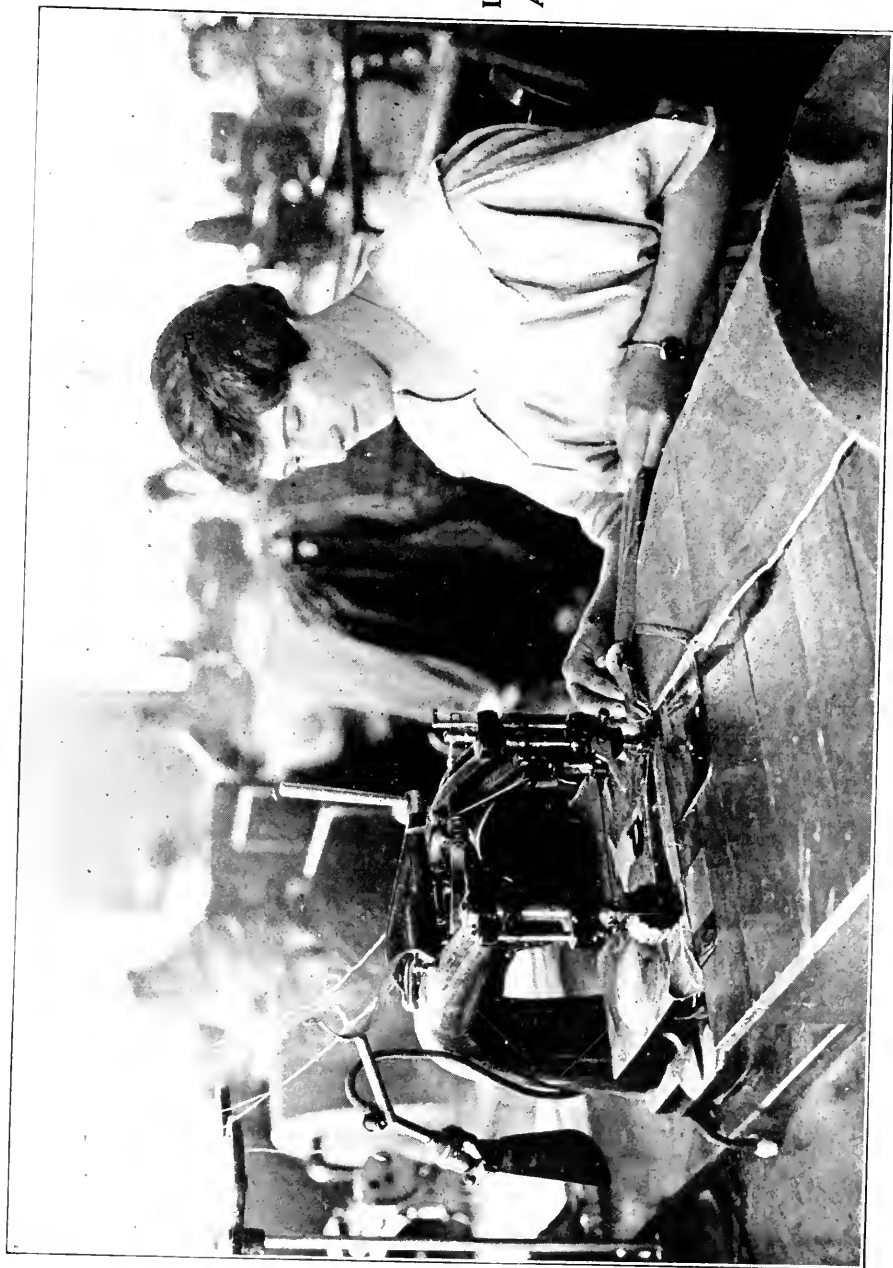
Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

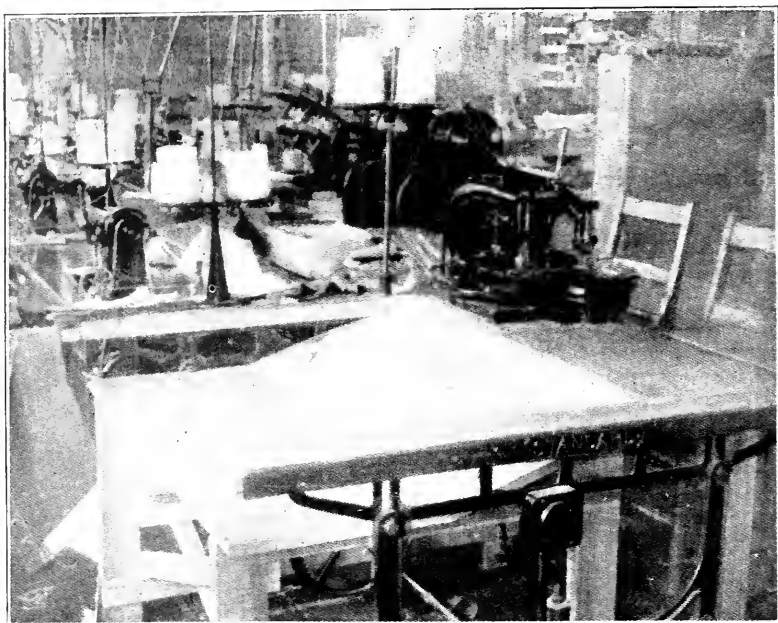
Number of stitches to the inch, 9.

Average production per hour, 11 dozen.



"BANDING" IN  
ONE OF THE  
LARGEST OVER-  
ALL PLANTS IN  
THE WORLD.





An ideal table arrangement is shown in the photographs on opposite page. The lower picture shows not less than 10 overall fronts on the table and the remaining fronts, or the balance of the bundle of two dozen, lying to the left of the operator, and still plenty of room.

## Hemming Bibs (Operation No. 6)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 24 soft in bobbin.

Number of stitches to the inch, 9.

Average production per hour,  $4\frac{1}{2}$  dozen.

## Stitching on Hip and Rule Pockets for Bib Overalls (Operation No. 7)

The following helpful hints are recommended as an aid to the operator:

The operation is started on the upper right hand corner of the pocket. The material is turned downwardly and inwardly by the operator and is guided by her finger. The bar on the edge of the presser foot is used as a guide for the edge of the pocket. An experienced operator will stitch around the side and bottom of the pocket, including the corners without stopping.

**Standard Equipment:** UNION SPECIAL Machine Style 8300 Z-4.

Presser Foot, 8220 B-4.

Feed Dog, 7205 A.

Throat Plate, 8224-4.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour,  $2\frac{1}{2}$  dozen.

## Felling Back Seams (Operation No. 8)

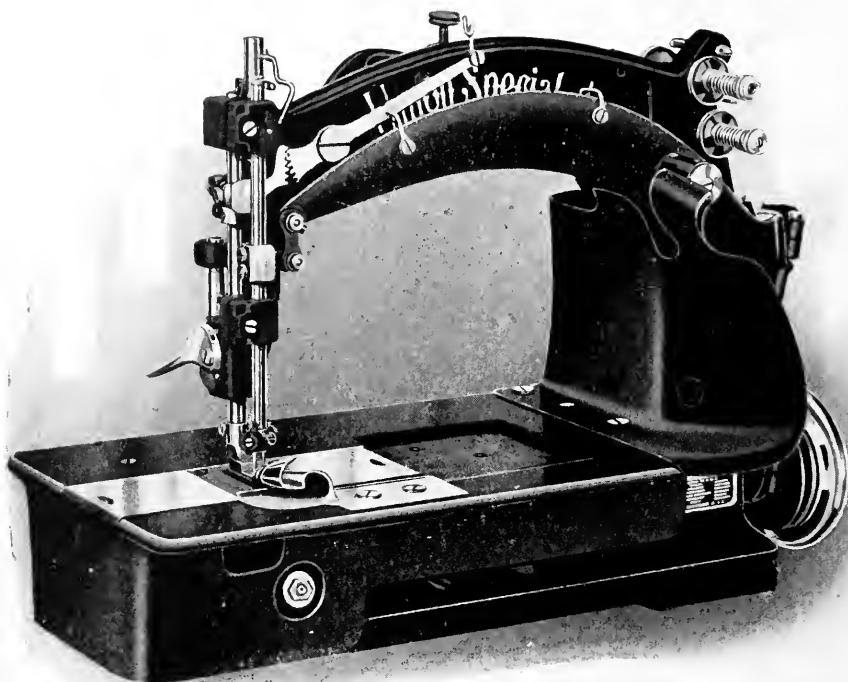
This operation consists of felling and stitching with two rows of stitches, the back or seat seam.

Note: For three rows of stitches see page 48.

The same helpful hints are recommended as for operation No. 4.

For the standard equipment, thread recommended, and number of stitches per inch for this operation, see operation No. 4, page 23.

Average production per hour, 13 dozen.



### Union Special Machine 7500

Used for operations Nos. 4 and 8 on overalls—felling bibs, seat seams, etc.

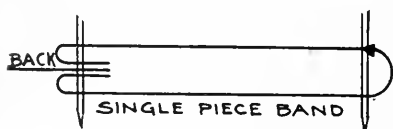
### Stitching on Single Piece Back Band to Bib Overalls (Operation No. 9)

This operation consists of attaching a strip or band to the top of the back at the same height as front band.

See page 24 for helpful hints.

**Standard Equipment:** UNION SPECIAL Two Needle Machine Style 16500 D-80 gauge, equipped with pulling mechanism.

Note: If desired, 88 and 96 gauge machines and parts can be had.



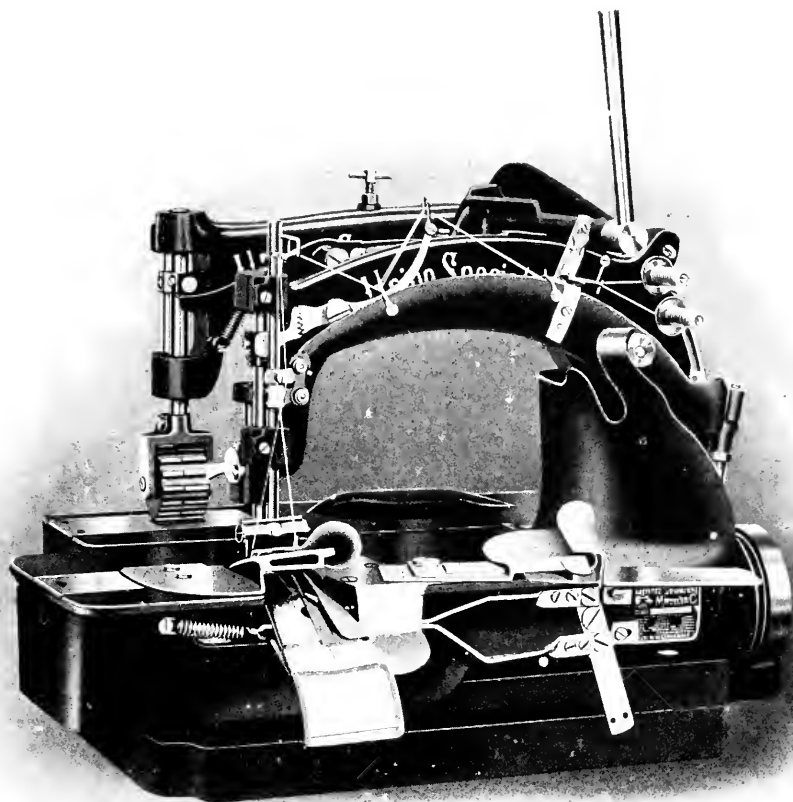
Collapsible Folder, 23360 C-1  $\frac{3}{8}$ .  
Or Noncollapsible Folder, 23360 B-1  $\frac{3}{8}$   
Presser Foot, 16220 B-80.  
Guide, 23300 A.  
Feed Dog, 16505-88.

Throat Plate, 16224-80.

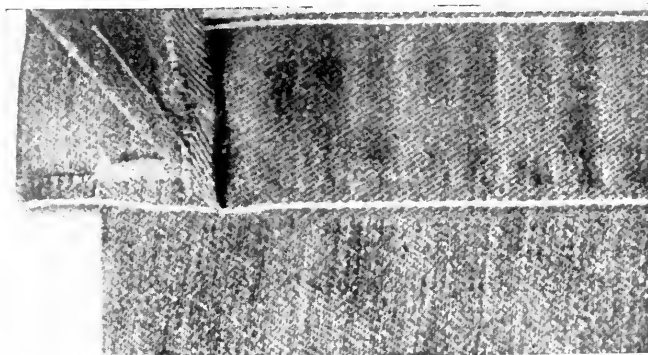
Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 22 dozen.



Union Special Machine Class 16500



Photograph of Single Piece Back Band

## Sewing Back Bands with Four Rows of Stitching

**Standard Equipment:** UNION SPECIAL Machine Style 16800 Z-4-16-64-16, equipped with pulling mechanism.

Top Folder, 23329 D.

Bottom Folder, 23324 K-96.

Presser Foot, 16834 D-16-64-16.

Feed Dogs, 1 No. 16805 B. 2 No. 16805 D-16.

Throat Plate, 16844 K-16-64-16.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 22 dozen.

## Stitching and Folding Two Piece Back Band to Bib Overalls

**Standard Equipment:** UNION SPECIAL Machine Style 16500 Z-80, equipped with pulling mechanism.

Note: If desired, 88 and 96 gauge machines and parts can be had.

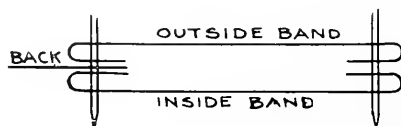
Collapsible Folder for under strip, 23324 K-80.

Folder for upper strip, 23328 H-80.

Presser Foot, 16220 B-80.

Guide, 23326.

Feed Dog, 16505-88.



Throat Plate, 16224-80.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 22 dozen.

## Hemming Sides of Back Band Overalls (Operation No. 10)

This operation consists of facing the sides of the overall at pockets, and attaching ticket.

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 24 soft in bobbin.

Number of stitches to the inch, 9.

Average production per hour,  $2\frac{1}{2}$  dozen.

## Felling In and Out Seams (Operation No. 11)

This operation consists of felling and stitching with two rows of stitches the inside and outside of legs.

Note: For three rows of stitches see page 48.

**Standard Equipment:** UNION SPECIAL Two Needle Machine Style 12100 B-5 gauge.

For illustration of this machine see page 23.

Folder, 601-5-7-64.

Presser Foot, 12120 E-5.

Feed Dog, 12105 E-5.

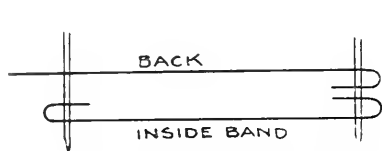
Throat Plate, 12124 E-5.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord 36 soft in looper.

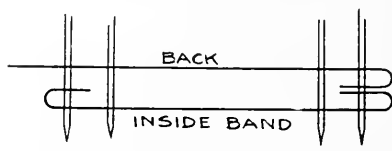
Number of stitches to the inch, 9.

Average production per hour,  $2\frac{1}{4}$  dozen.

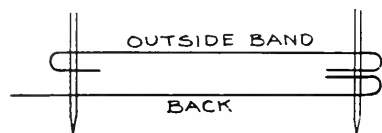
# A page of typical band seam constructions for overalls



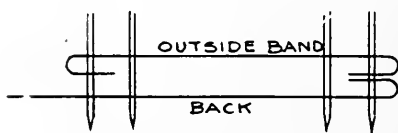
Folders 23329 D and 23324 K



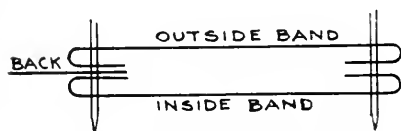
Folders 23329 D and 23324 K



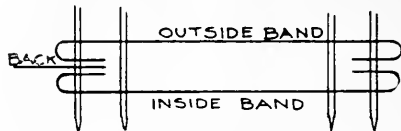
Folders 23328 H and 23329 B



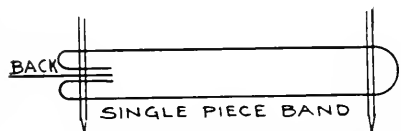
Folders 23328 H and 23329 B



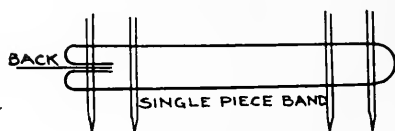
Folders 23328 H and 23324 K



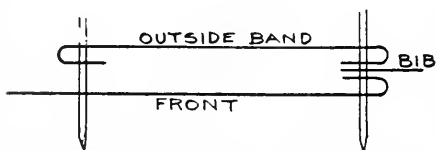
Folders 23328 H and 23324 K



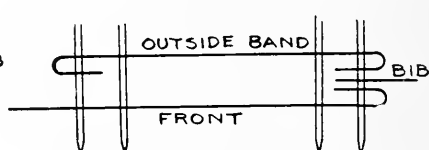
Folder 23360 C or 23360 B



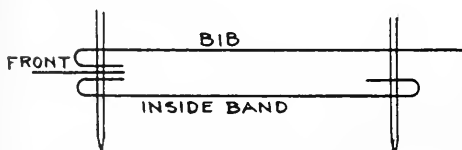
Folder 23360 B



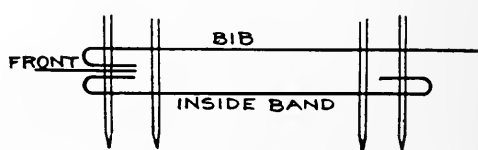
Folders 23328 H and 23329 B



Folders 23328 H and 23329 B



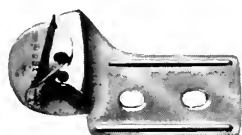
Folders 23325 E and 23324 K



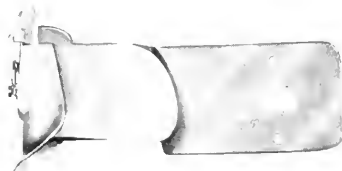
Folders 23325 E and 23324 K



A page of standard folders used in making overalls



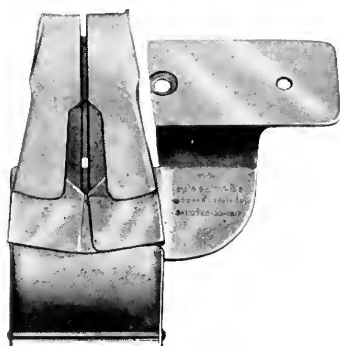
600



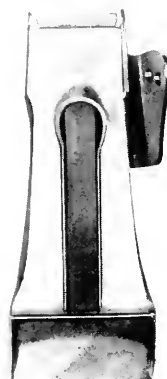
23325 E



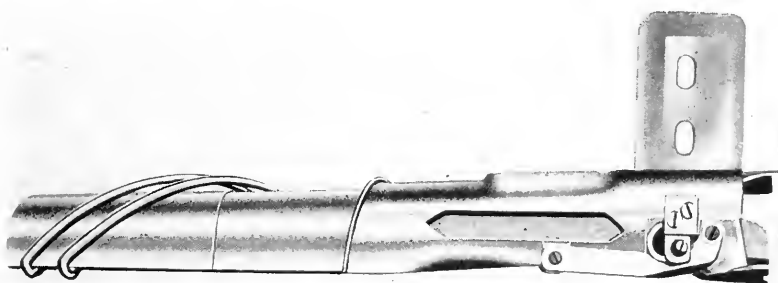
23367



23324 K



23328 H



Bottom View of Single Piece Back Band Folder, Illustrating  
Collapsible Feature

23360 C

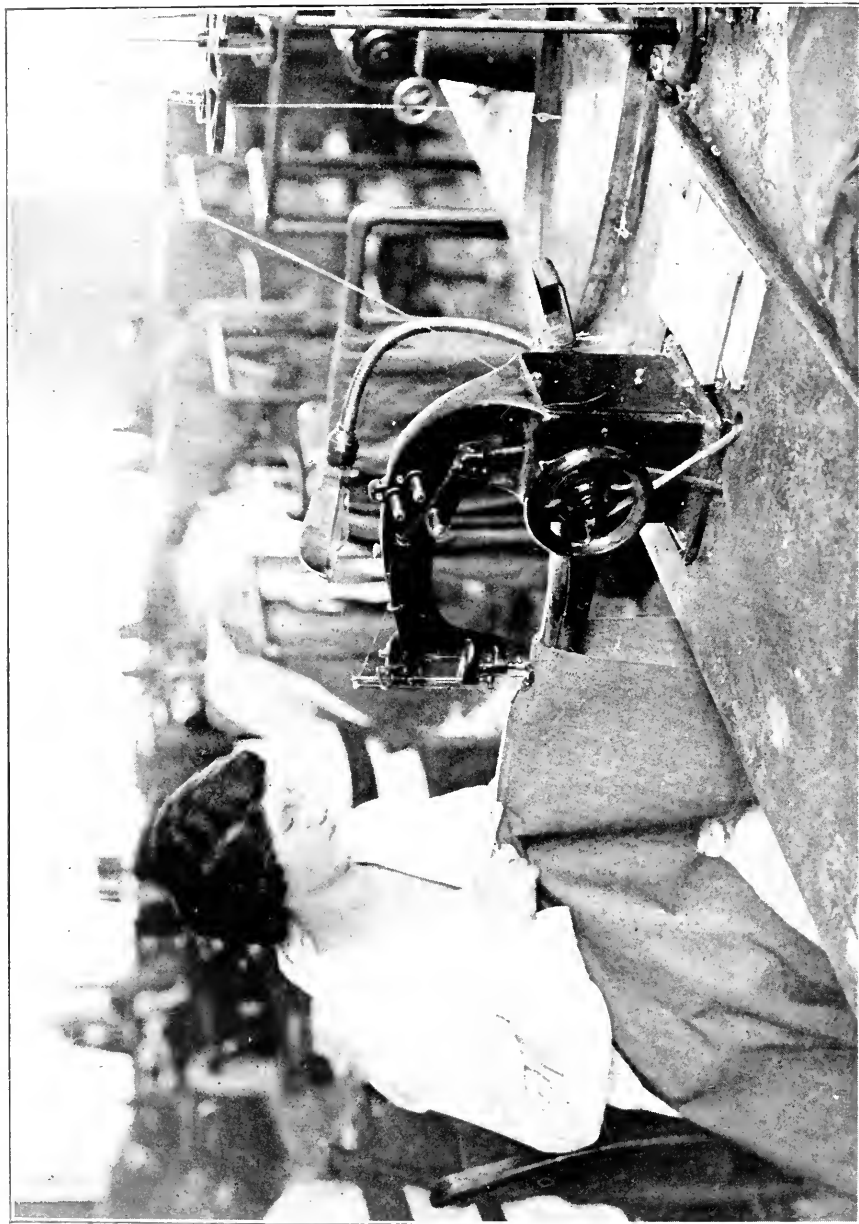
FELLING IN and  
OUT SEAMS

on

UNION SPECIAL  
CLASS 12100

in

One of the Largest  
Overall Plants in  
the World



## Hemming Bottoms (Operation No. 12)

**Standard Equipment:** UNION SPECIAL Single Needle Machine Style 11500 G- $\frac{3}{8}$  inch.

Hemmer, 23364.

Presser Foot, 11520 H- $\frac{3}{8}$ .

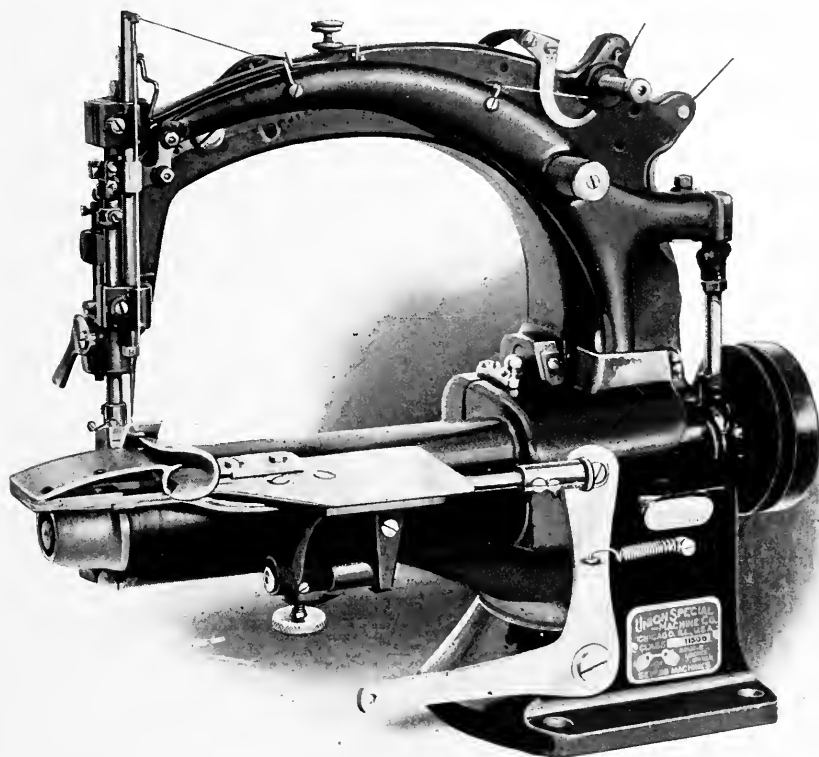
Feed Dog, 11505 H.

Throat Plate, 11524 H.

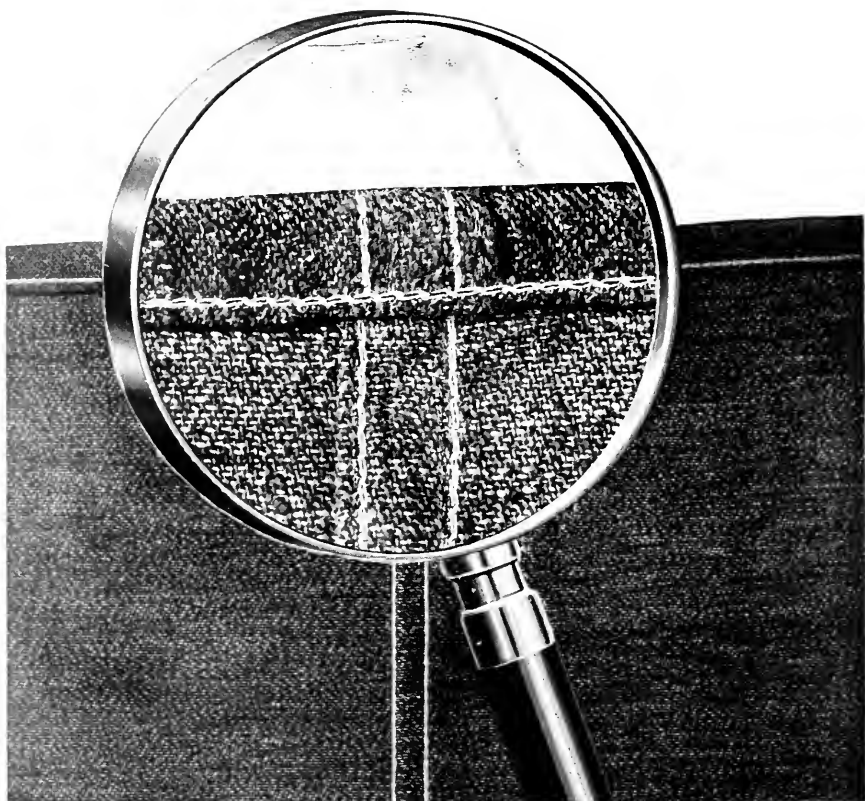
Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 9 dozen.



Union Special Machine Class 11500, for Hemming Bottoms of Overalls



**Actual Photograph of Hemmed Bottom**

## **BUTTON-HOLES (Operation No. 13)**

**Standard Equipment:** Button-hole machine.

See operation No. 2, page 21, for fly button-holes.

Average production per hour, 8 dozen.

## **Tacking (Operation No. 14)**

**Standard Equipment:** Tacking Machine.

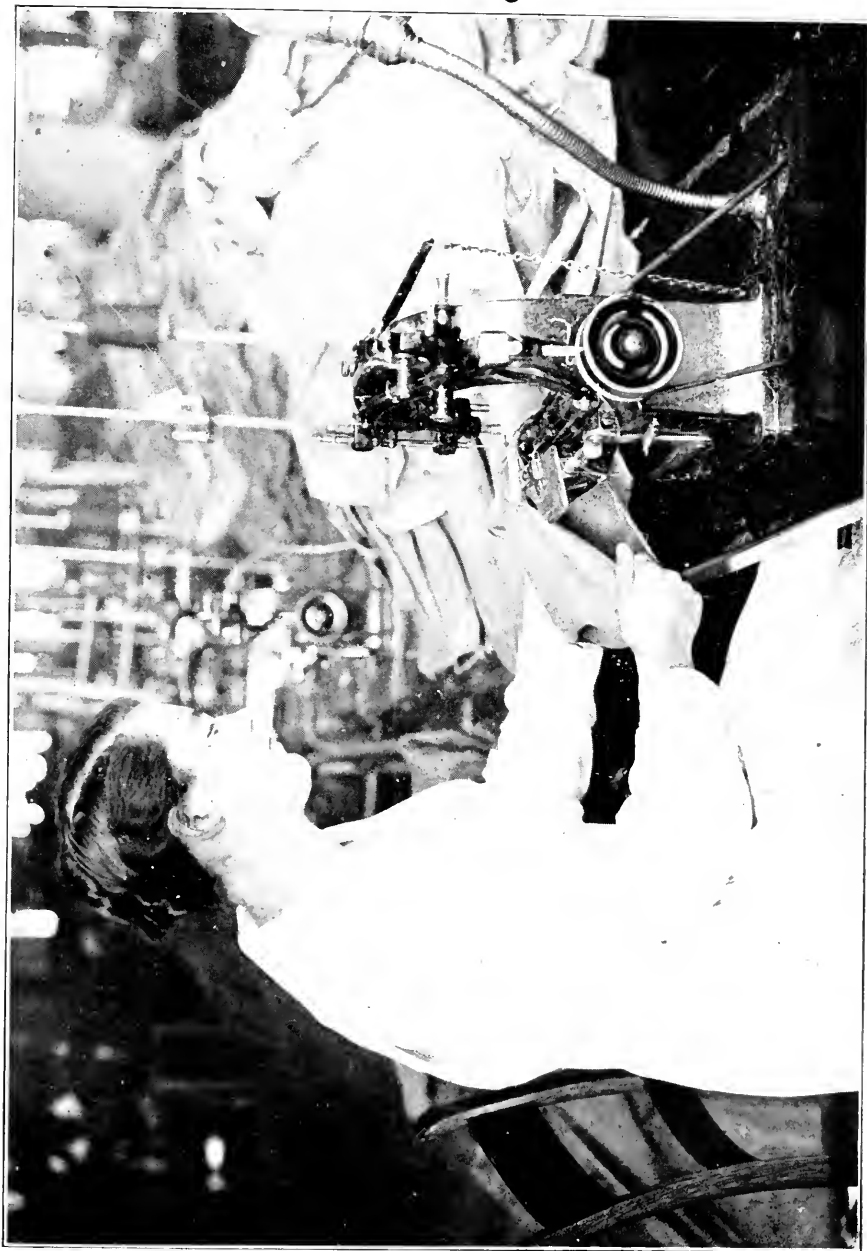
Average production per hour, 7 dozen.

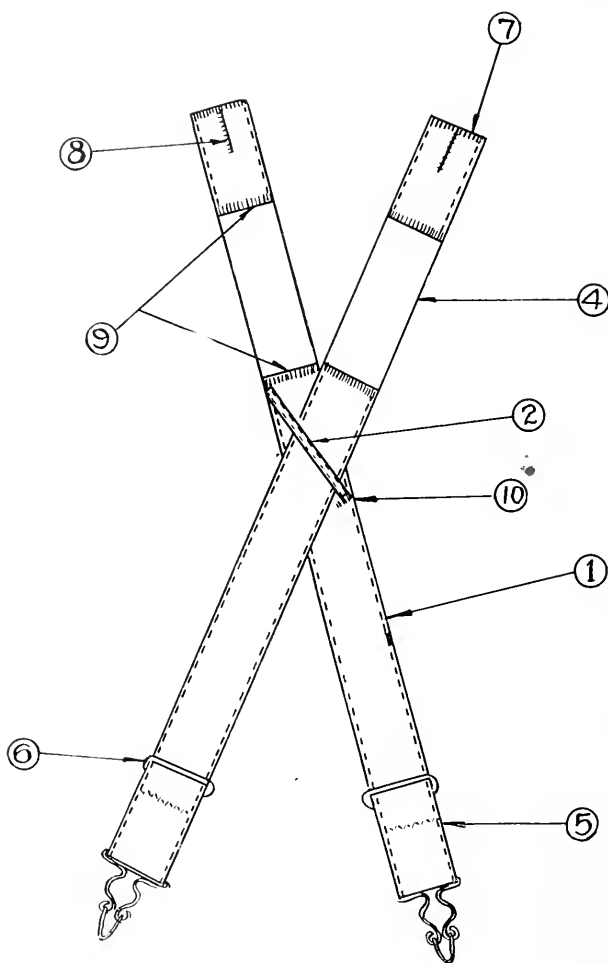
## **Attaching Buttons (Operation No. 15)**

**Standard Equipment:** Button Machine.

Average production per hour, 11¼ dozen.

**"HEMMING  
BOTTOMS"  
on  
UNION SPECIAL  
CLASS 11500  
in  
One of the Largest  
Overall Plants in  
the World**





## List of Operations on Suspenders for back band Overalls

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. Stitching shoulder straps</li> <li>2. Stitching suspender loops</li> <li>3. Cross cutting shoulder straps</li> <li>4. Cutting elastic</li> <li>5. Attaching buckles</li> <li>6. Attaching metal loops</li> </ol> | <ol style="list-style-type: none"> <li>7. Finishing raw edge of button-hole tabs</li> <li>8. Sewing button-holes</li> <li>9. Barring</li> <li>10. Tacking free end of suspender loop</li> <li>11. Inspection</li> </ol> |
|--|---|

## Making Suspenders for Back Band Overalls

The blue denim in all weights is supplied in 28 inch widths. Shoulder straps are cut 3 15-16 inch wide and finished to 1 3/4 inch wide. Quite often the bolt of cloth is too narrow to permit the cutting of seven full size strips. When this occurs the narrow strip is cut up for suspender loops. These loops are cut 5/8 inch wide and the narrow strip usually furnishes five strips for suspender loops.

A machine for splitting cloth into widths for this operation can be had on the market which will cut and roll the strips in one operation and which has a capacity of several thousand dozen daily.

### Stitching Shoulder Straps (Operation No. 1)

These machines are either run singly or as many as three simultaneously, one operator running all three machines, using a special device which is connected with the transmitters, for control.

**Standard Equipment:** UNION SPECIAL Two Needle Machine Style 16500 Z-104, equipped with pulling mechanism.

Folder, K-30822.

Feed Dog, 16250-96.

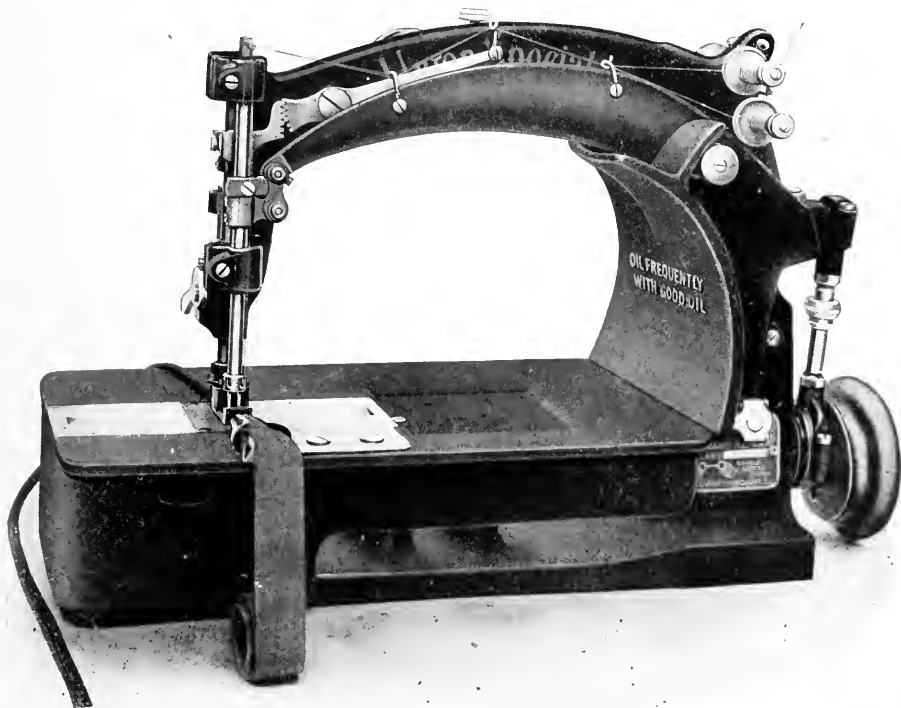
Presser Foot, 16527 C-104.

Throat Plate, 16224-104.

Thread recommended, 3 cord, 40 silk finish in needle, 2 cord, 50 soft finish in looper.

Number of stitches to the inch, 12.

Average production per hour for each machine, 430 yards.



Union Special Machine 6900 H

## Stitching Suspender Loops (Operation No. 2)

The machine for stitching suspender loops can be run simultaneously with the shoulder strap machines, thus requiring only one operator for as many as four machines if desired.

**Standard Equipment:** UNION SPECIAL Machine Style 6900 H-16.

See page 41 for illustration

Folder, 23254 L.

Presser Foot, 6920 A-16.

Feed Dog, 6905 H-16.

Throat Plate, 6924 H-16.

Thread recommended, 3 cord, 40 silk finish in needle, 2 cord, 50 soft finish in looper.

Average production per hour for each machine, 600 yards.

## Cross Cutting Shoulder Straps (Operation No. 3)

This operation consists of cutting the shoulder straps, button hole tabs, and suspender loops to the proper length. There is a machine on the market adjustable to any length and which has the capacity of several thousand dozen daily.

## Cutting Elastic (Operation No. 4)

This operation consists of using a small, electric, circular knife machine which is attached to the table. The operator guides the work through the machine, cutting the elastic at the mark woven or printed thereon for that purpose. This machine is capable of cutting 1500 dozen daily.

## Attaching Buckles (Operation No. 5)

The machine for this operation is installed with a wooden hopper holding the buckles. This hopper is set in rear of the machine and the open end is inclined so that the buckles are fed to fall on the cloth plate, making it handy for the operator, and preventing the buckles from spreading over the table.

**Standard Equipment:** UNION SPECIAL Machine Style 9900 Z.

Feed Dog, 9905.

Throat Plate, 9928 E.

Presser Foot, 9920.

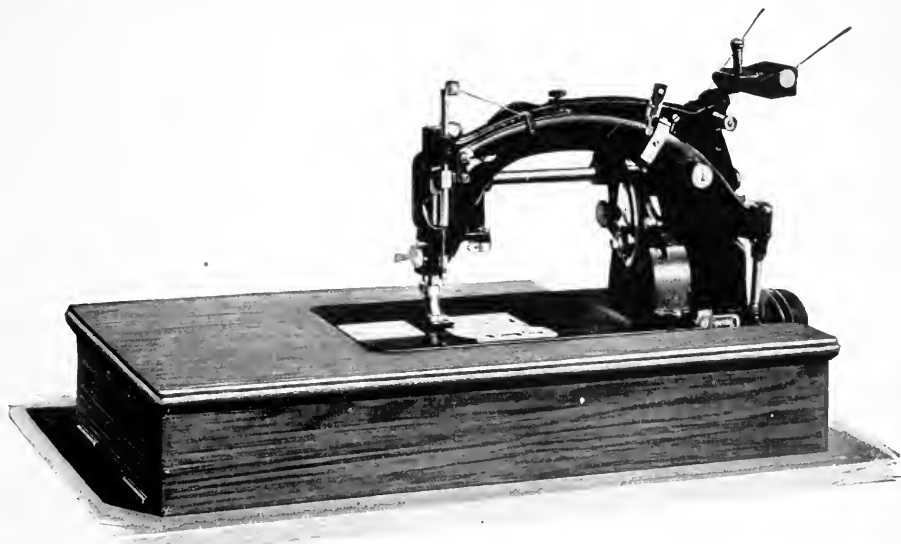
Thread recommended, 3 cord, 40 silk finish in needle, 2 cord, 50 soft finish in looper.

Average production per hour, 2½ dozen pair.

## Attaching Metal Loops (Operation No. 6)

This operation consists of inserting the free end of suspender strap through the buckle. This is a hand operation.





### Union Special Machine Class 9900 for Attaching Buckles

#### Finishing Raw Edge of Button-Hole Tabs (Operation No.7)

**Standard Equipment:** UNION SPECIAL Machine Style 15400 Z (3 thread stitch).

Presser Foot, 15424 J.

Throat Plate, 15420 A.

Feed Dog, 15405 W.

Thread recommended, 3 cord, 40 silk finish in needle, 2 cord, 40 soft finish in looper.

Average production per hour, 32 dozen pair.

#### Sewing Button-Holes (Operation No. 8)

**Standard Equipment** Button-hole Machine.

Average production per hour, 650 holes.

#### Barring (Operation No. 9)

This operation consists of attaching button-hole tab to the elastic and then attaching the other end of the elastic and the suspender loop to the shoulder strap.

**Standard Equipment:** UNION SPECIAL Machine Style 15500 Z (3 thread stitch).

Presser Foot, 15520 G.

Feed Dog, 15505 C.

Throat Plate, 15528 K.

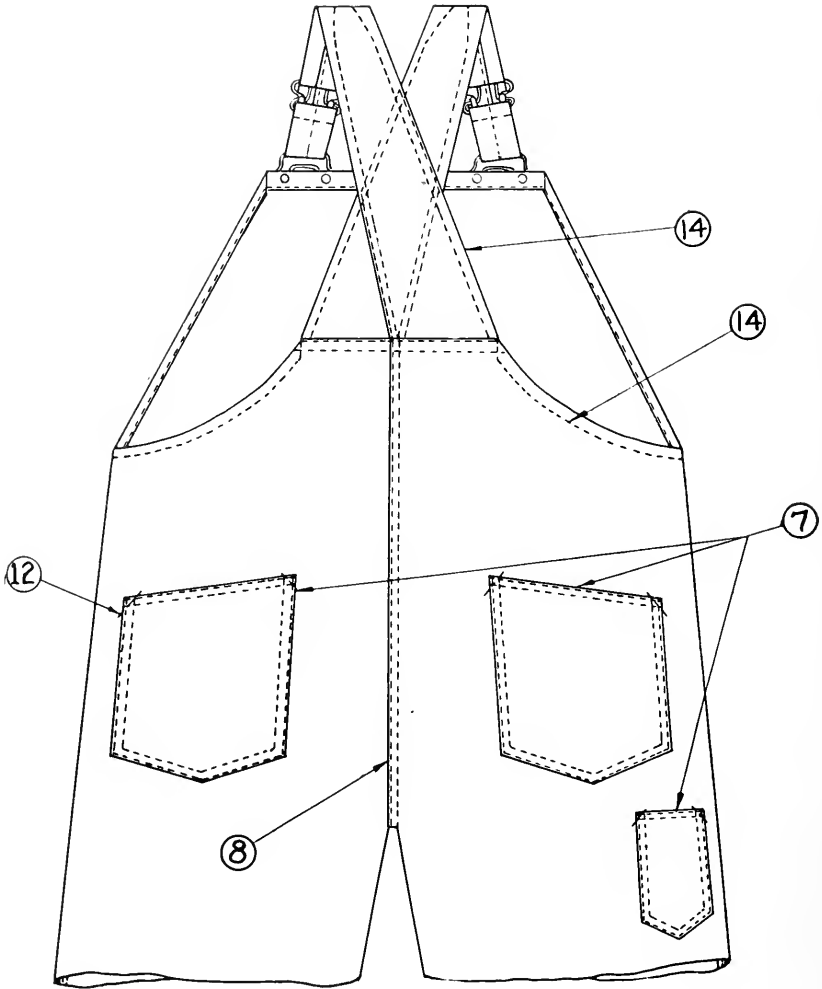
Thread recommended, 3 cord, 40 silk finish in needle, 2 cord, 40 soft finish in looper.

Average production per hour, 10 dozen pair.

#### Tacking Free End of Suspender Loop (Operation No. 10)

**Standard Equipment:** Tacking Machine.

Average production per hour, 38 dozen pair.



## High Back Overalls

High back overalls are made exactly the same as back band overalls with the exception that the suspenders are attached to the back, shown in the accompanying figure.

### List of Operations on High Back Overall.

- |  |   |
|--|---|
| 1. Making fly                              | 9. Felling in and out seams   |
| 2. Sewing fly button-holes                 | 10. Hemming bottoms   |
| 3. Making front                            | 11. Sewing button-holes   |
| 4. Felling bib seam                        | 12. Tacking   |
| 5. Sewing on front band and attaching bibs | 13. Attaching buttons   |
| 6. Hemming bib                             | 14. Making and attaching suspenders, hemming sides and sewing on ticket |
| 7. Stitching hip and rule pockets to back  | 15. Trimming loose threads  |
| 8. Felling back seam                       | 16. Final inspection and folding  |

It will be noted that the operations for a High Back Bib Overall are the same as for a Back Band Bib Overall with the exception of operation No. 14. Hence it will only be necessary to describe this operation.

### Making and Attaching Suspenders. Hemming Sides of back and Sewing on Tickets (operation No. 14)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord 24 soft in bobbin.

Number of stitches to the inch, 9.

Average production per hour, 1 dozen.

Note: We are specifying standard gauges only. Any other gauge desired can be obtained; all that is needed is to notify us of your requirements.

### Standard Table of Gauges

No. 1 gauge 3-32 inch.	No. 4½ gauge ¼ inch.
No. 2 gauge ⅛ inch.	No. 5 gauge 9-32 inch.
No. 3 gauge 5-32 inch.	No. 5½ gauge ⅜ inch.
No. 4 gauge 3-16 inch.	No. 6 gauge 13-32 inch.

For any gauge not shown in above table the following rule will prevail:

#### Specify Gauges by 64ths of an inch

For example:—If it is desired to have ½-inch space between stitches, the number of the gauge would correspond to the number of the 64ths or 32.

Likewise ¾-inch width would be 48 gauge.

## Triple Stitched Overalls

The Union Special Machine Co. has perfected and has in successful operation three needle machines for stitching the principal seams of overalls with three rows of stitches, giving greater strength, elasticity and a better appearance than the two rows of stitching. Garments sewed with these machines stand up better in laundering, and retain a neat, smooth finish until discarded, due to the fact that the triple stitched seam will not pucker. The center or third row of stitching prevents the puckering or lifting of the fabric between the two outside rows of stitching.

The puckered garment is not only unsightly but it is weak as well, for the high spots of the puckered seam soon wear down and with it the stitching, resulting in the opened seam.

That the three stitched seam requires more thread in lineal feet goes without saying, but this small increase in consumption of thread is more than offset by the greater demand for triple stitched product.

The resulting seam of a three needle machine is flat and straight and twisted overall legs are automatically eliminated by use of the machines described below.

There is no more mechanical attendance necessary in a three needle machine than in a two needle machine.

These machines run from 2600 to 2800 R. P. M., which is as fast as the average operator can handle the work.

The wearers of overalls and other work garments are learning that triple stitched seams last longer and look better than those stitched with two rows of stitching.

Overall manufacturers find four distinct advantages in the use of triple stitch machines:

1. They produce a flat seam; center needle stitches down the raw edges of the lapped seam and prevents bunching of material between rows of stitching when garment is washed.

2. The triple stitch eliminates the twisted leg effect and makes the overall hang straight.

3. It improves the wearing quality of the garment.

4. It gives the manufacturer who uses it an effective new sales appeal, an important factor in meeting the present keen competition.

And in addition to these qualities it gives you the high speed, uniform Double Locked stitch and simple operation characteristic of all Union Special Machines.

We give below a partial list of manufacturers of triple stitched overalls.

The largest mail order houses, such as Montgomery Ward & Co., Sears, Roebuck & Co., specify triple stitched work garments almost exclusively.

Alexander Bennie Co. ....	Nashville, Tenn.
H. A. Allen Mfg. Co. ....	Nashville, Tenn.
Altoona Overall Co. ....	Altoona, Pa.
American Overall Co. ....	Harrison, Ohio
American Wholesale Corp. ....	Baltimore, Md.
Buckeye Overall Co. ....	Versailles, Ohio
Peter Blum ....	Mount Healthy, Ohio
B. & O. Mfg. Co. ....	Baltimore, Md.
Caldwell Overall Co. ....	Hillsboro, Ohio
Central Overall Co. ....	Baltimore, Md.
Charleston Mfg. Co. ....	Charleston, W. Va.
L. C. Chase & Co. ....	Watertown, Mass.
Cohn Goldwater & Co. ....	Los Angeles, Calif.
Cooper, Coats & Case D. C. Co. ....	Los Angeles, Calif.
Cowden Mfg. Co. ....	Kansas City, Mo.
Crane Overall Mfg. Co. ....	Jeffersonville, Ind.
Federation Overall Mfg. Co. ....	Davenport, Iowa
Wm. M. Finck & Co. ....	Detroit, Mich.
M. Fine & Sons ....	New Albany, Ind.
Forest City Overall Co. ....	Rockford, Ill.
Freeland Overall Mfg. Co. ....	Freeland, Pa.
Gem Shirt Co. ....	Dayton, Ohio
Globe Overall Co. ....	Cincinnati, Ohio
Globe-Superior Corp. ....	Abingdon, Ill.
Goldstone Bros. ....	San Francisco, Calif.
Gross Bros. Mfg. Co. ....	Galesburg, Ill.
Guiterman Bros. Co. ....	St. Paul, Minn.
Knocker Shirt Co. ....	Portland, Ind.
The Iron King Overall Co. ....	Baltimore, Md.
The Ironall Factories ....	Cincinnati, Ohio
La Crosse Garment Co. ....	La Crosse, Wis.
Lang Mfg. Co. ....	St. Paul, Minn.
Large & Roomy Overall Mfg. Co. ....	Cincinnati, Ohio
H. D. Lee Mercantile Co. ....	Kansas City, Mo.
H. D. Lee Mercantile Co. ....	Minneapolis, Minn.
H. D. Lee Mercantile Co. ....	South Bend, Ind.
H. D. Lee Mercantile Co. ....	Trenton, New Jersey
Levy Overall Mfg. Co. ....	Cincinnati, Ohio
L. Lewin & Sons ....	Chicago, Ill.
Little Bros. Co. ....	Knoxville, Tenn.
Louisville Overall Co. ....	Louisville, Ky.
Martin Bros. Co. ....	La Crosse, Wis.
Lewis Meier Co. ....	Indianapolis, Ind.
Miller Mfg. Co. ....	Kansas City, Mo.
Motor Clothing Co. & Southern Overall Co. ....	Baltimore, Md.
Patrick-Duluth Garment Co. ....	Duluth, Minn.
Reliance Mfg. Co. ....	Chicago, Ill.
Regal Mfg. Co. ....	Knoxville, Tenn.
Rice Stix D. G. Co. ....	St. Louis, Mo.
Rombo Bros. ....	Baltimore, Md.
Rosenberg Co. ....	Winona, Minn.
Rosenbloom S. ....	Baltimore, Md.
Shimelfarb, H. ....	Chicago, Ill.
Simon & Mogilner ....	St. Paul, Minn.
J. W. Sinnock & Sons ....	Quincy, Ill.
Stevenson Overall Co. ....	Portland, Ore.
Twin City Mfg. Co. ....	Minneapolis, Minn.
United States Overall Co. ....	Ft. Worth, Texas
United States Overall Mfg. Co. ....	Cincinnati, Ohio
Warsaw Overall Co. ....	Warsaw, Ind.
Wheeler & Motter Merc. Co. ....	St. Joseph, Mo.
Western Mfg. Co. ....	Minneapolis, Minn.
Western Union Mfg. Co. ....	Kansas City, Mo.
Wyman-Partridge D. G. Co. ....	Minneapolis, Minn.

## Felling bib Seam

**Standard Equipment:** UNION SPECIAL Three Needle Machine Style 31500 B.

Folder, 23367-9-7-64.

Presser Foot, 31520 C-9.

Feed Dog, 31505 B-10.

Throat Plate, 31524 B-9.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 26 dozen.

Note: This operation can also be accomplished very efficiently on a Flat Bed machine, giving the same high grade results.

**Standard Equipment:** UNION SPECIAL Machine Style 17100 C.

Folder, 23331-9-7-64.

Presser Foot, 17120 D-9.

Feed Dog, 17105 C-10.

Throat Plate, 17124 C-9.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 26 dozen.

## Felling back Seam

The same equipment is recommended as for Felling Bib Seam.

Average production per hour, 13 dozen.

## Felling In and Out Seams

**Standard Equipment:** UNION SPECIAL Machine Style 31500 B.

Folder, 23367-9-7-64.

Presser Foot, 31520 C-9.

Feed Dog, 31505 B-10.

Throat Plate, 31524 B-9.

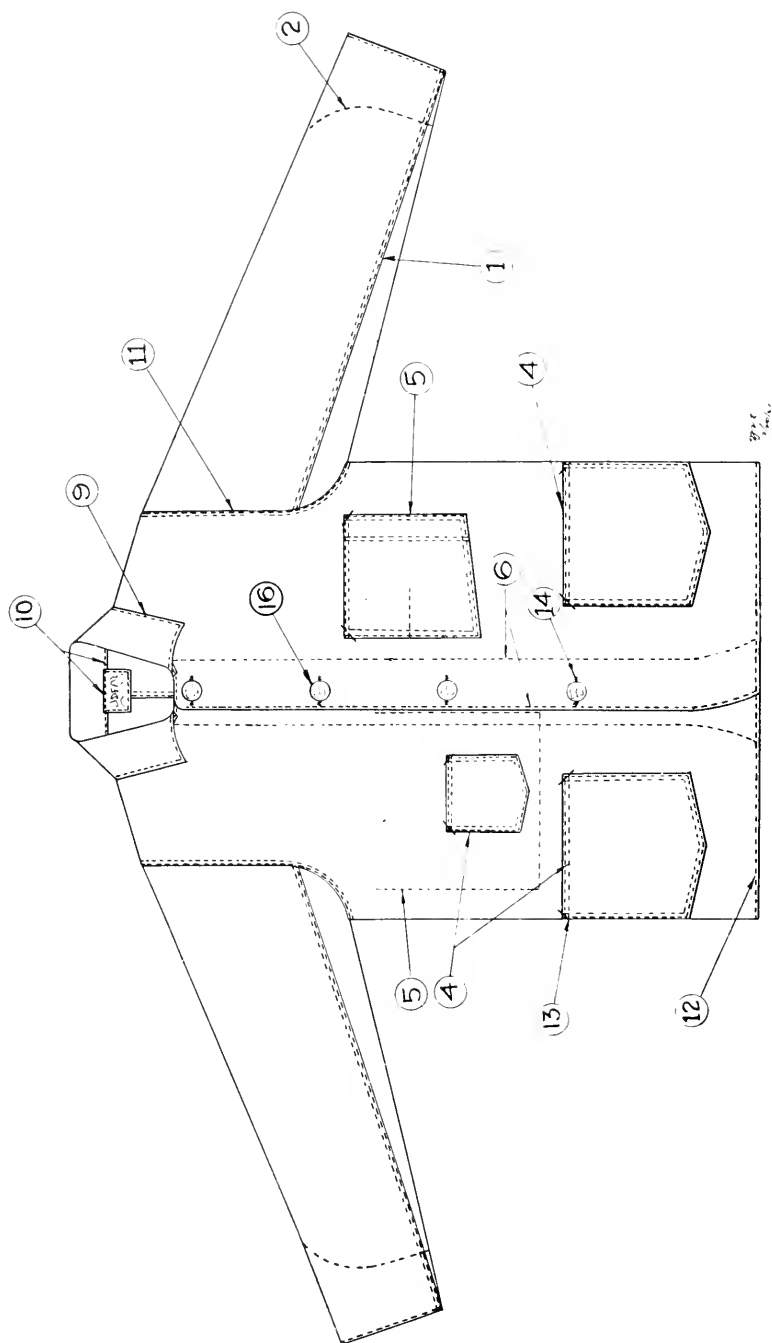
Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

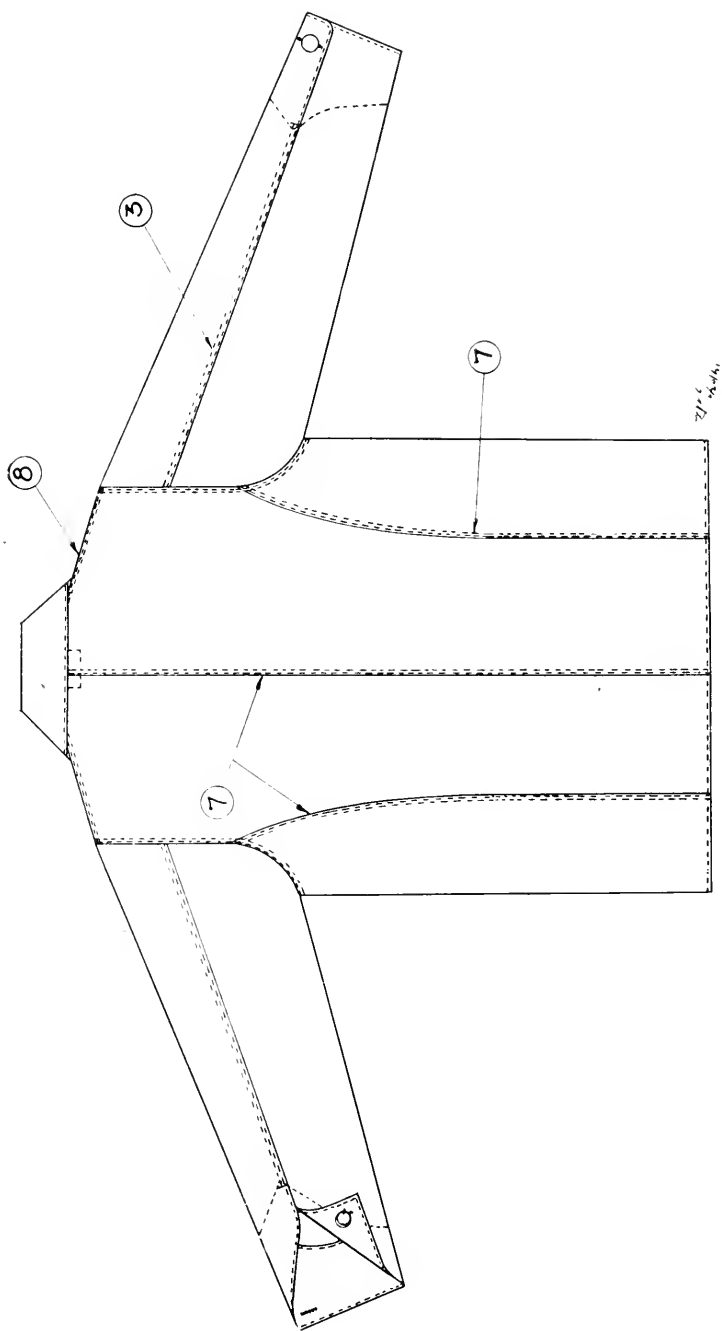
Average production per hour, 2¼ dozen.



The above photograph illustrates why Union Specials are universally used for sewing the seams of overalls and any other garment that requires strength, elasticity and attractiveness. The carpenter shown in the above picture bends down in a similar position hundreds of times daily, stretching and straining every seam in the overall. But he can put all his thought on his work for there is absolutely no danger of ripping. His overalls are sewed on Union Specials.







## List of Operations on Overall Jackets with Sleeves Set in Tubular Form

1. Piecing sleeves.
2. Facing sleeves for cuffs.
3. Felling sleeves in tubular form.
4. Stitching two large and one small pocket to fronts.
5. Stitching one inside pocket and one combination pocket to front.
6. Stitching facing to front.
7. Stitching center back seam and felling two side back seams.
8. Joining fronts to back at shoulder seam.
9. Making collar.
10. Sewing on collar and ticket.
11. Setting in tubular sleeves.
12. Hemming bottom of body.
13. Tacking.
14. Sewing button-holes.
15. Eyelets for detachable buttons.
16. Attaching buttons.
17. Trimming all loose threads and shaking.
18. Final inspection and folding.

For operations on overall jackets with sleeves set in flat, instead of tubular, see page 62.



Actual Photograph of a High Grade  
Overall Jacket

Note the triple stitched seams.

## Description of Operations and Equipment for Overall Jackets with Sleeves set in Tubular Form

### Piecing Sleeves (Operation No. 1)

See page 60 for stitching this operation with 3 rows of stitches.

For sleeves as shown in the figure on page 50, the cuffs consist of an inside facing. This requires the piecing operation to be done prior to the facing and the felling of sleeves in tubular form after facing.

**Standard Equipment:** UNION SPECIAL Two Needle Machine  
Style 7500 B-5 gauge.

Note: 4 and  $4\frac{1}{2}$  gauge can be had if desired.

Folder, 600-5-7-64.

Presser Foot, 198 A-5.

Feed Dog, 7505.

Throat Plate, 7524 B-5.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 9 Dozen.

Note: This operation can also be done very efficiently on a Cylinder Machine, giving the same high grade result.

**Standard Equipment:** UNION SPECIAL Two Needle Machine  
Style 12100 B-5 gauge.

Note: 4 and  $4\frac{1}{2}$  gauge can be had if desired.

Folder, 601-5-7-64.

Presser Foot, 12120 E-5.

Feed Dog, 12105 E-5.

Throat Plate, 12124 E-5.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 9 Dozen.

### Facing Sleeves for Cuffs (Operation No. 2)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Number of stitches to the inch, 9.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 24 soft in bobbin.

Average production per hour, 2 Dozen.

## Felling Sleeve in Tubular Form (Operation No. 3)

See page 60 for Triple Stitching this operation.

**Standard Equipment:** UNION SPECIAL Two Needle Machine  
Style 12100 B-5 gauge.

Order 4 or 4½ gauge if desired.

Folder, 601-5-7-64.

Presser Foot, 12120 E-5.

Feed Dog, 12105 E-5.

Throat Plate, 12124 E-5.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 9 Dozen.



Felling Sleeves on Union Special Class 12100.

## Stitching on One Small and Two Large Patch Pockets to Front (Operation No. 4)

The following helpful hints are recommended as an aid to the operator:

The operation is started on the upper right-hand corner of the pocket. The material is turned downwardly and inwardly by the operator and is guided by her finger. The bar on the edge of the presser foot is used as a guide for the edge of the pocket. An experienced operator will stitch around the side and bottom of the pocket, including the corners, without stopping.

**Standard Equipment:** UNION SPECIAL Machine Style 8300 Z-4 gauge.  
 Presser Foot, 8220 B-4.  
 Feed Dog, 7205 A.  
 Throat Plate, 8224-4.  
 Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.  
 Number of stitches to the inch, 9.  
 Average production per hour, 2½ dozen.

### Stitching One Inside Pocket and One Combination Pocket to Front (Operation No. 5)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.  
 Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 24 soft in bobbin.  
 Number of stitches to the inch, 9.  
 Average production per hour, 3 Dozen.

### Stitching Facing to Front (Operation No. 6)

This operation consists of stitching a strip inside of fronts, one for attaching buttons and the other for sewing in button-holes.

**Standard Equipment:** UNION SPECIAL Machine Style 16500 Z-96.  
 Folder, 23324 K-96.  
 Presser Foot, 16220 B-96.  
 Feed Dog, 16505-96.  
 Throat Plate, 16224-96.  
 Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.  
 Number of stitches to the inch, 10.  
 Average production per hour, 9 dozen.

### Stitching Center Back Seams and Two Side Back Seams (Operation No. 7)

See page 60 for Triple Stitching this operation.  
 The same equipment is recommended as for operation No. 1.  
 Average production per hour, 3 dozen.

### Joining Fronts to Back at Shoulder Seam (Operation No. 8)

See page 61 for Triple Stitching this operation.  
 This operation is done with the same equipment as given for operation No. 1.  
 Average production per hour, 10 dozen.

### Making Collar (Operation No. 9)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.  
 Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 24 soft in bobbin.  
 Number of stitches to the inch, 9.  
 Average production per hour, 8 dozen.

## Stitching Collar and Ticket to Body (Operation No. 10)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 24 soft in bobbin.

Number of stitches to the inch, 9.

Average production per hour, 5 dozen.

## Setting in Tubular Shaped Sleeves (Operation No. 11)

See page 61 for Triple Stitching this operation.

This operation consists of attaching sleeves to body, after sleeves are in tubular form.

**Standard Equipment:** UNION SPECIAL Two Needle Machine Style 11700C5 gauge.

Attachment, 23291E-5-7-64.

Presser Foot, 11720F5.

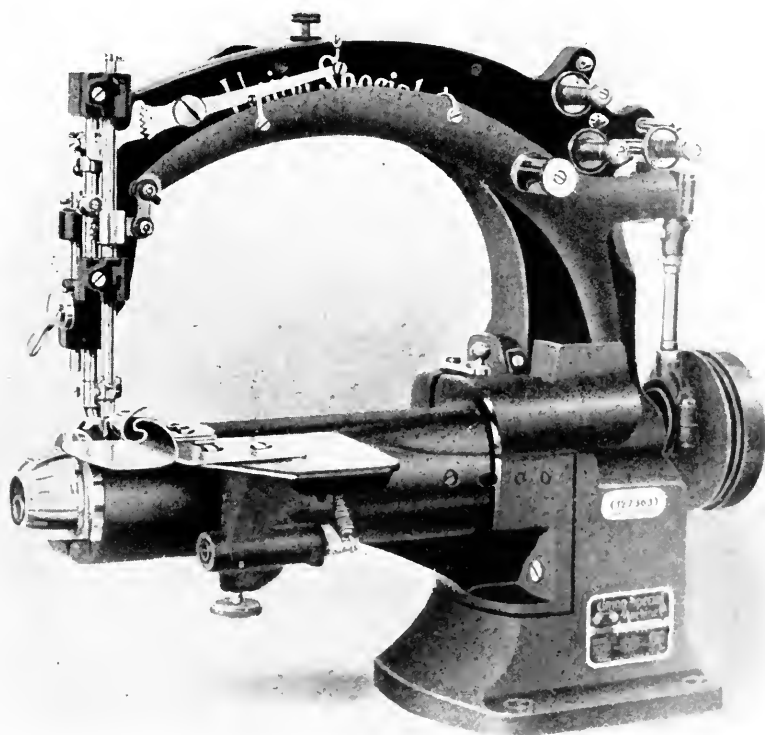
Feed Dog, 11705B.

Throat Plate, 11724A5.

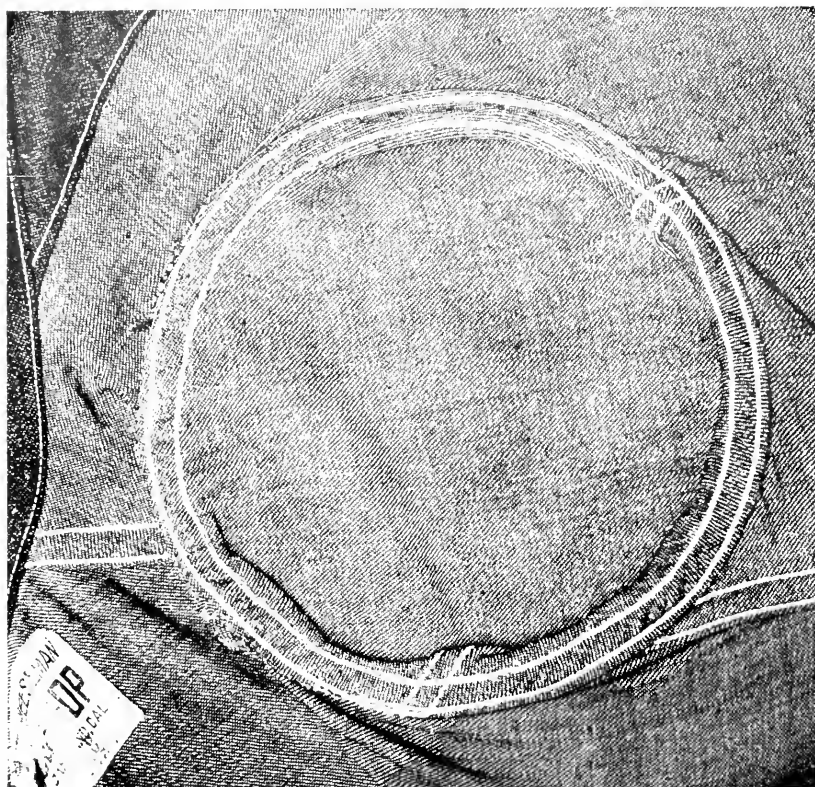
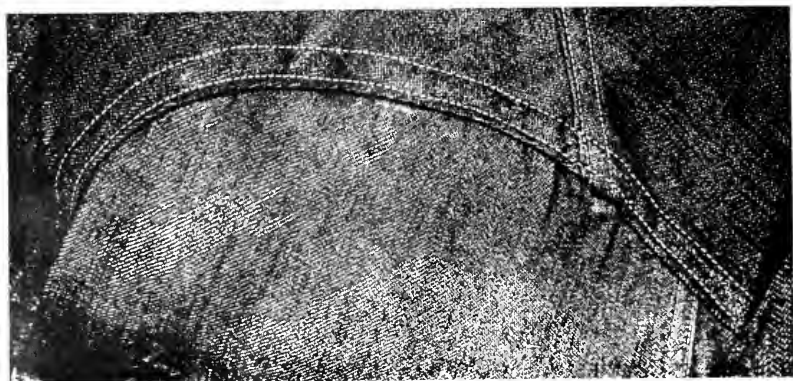
Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 2½ dozen.



Union Special Machine Class 11700 used for Setting In Tubular Sleeves



**Outside and Inside View of Sleeve Set in Jacket on Machine  
Class 11700.**



## Hemming Bottom of Body (Operation No. 12)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 24 soft in bobbin.

Number of stitches to the inch, 9.

Average production per hour, 7 dozen.

For making a very substantial and attractive hem, with the Double Locked Stitch, we recommend the following:

Single Needle UNION SPECIAL Machine 11500 G.

Folder, 23364.

Presser Foot, 11520H for  $\frac{3}{8}$  or  $\frac{1}{2}$  inch hem.

Feed Dog, 11505 H.

Throat Plate, 11524 H.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 7 Dozen.

## Tacking (Operation No. 13)

**Standard Equipment:** Tacking Machine.

Average production per hour, 8 dozen.

## Sewing Button-Holes (Operation No. 14)

**Standard Equipment:** Button-hole Machine.

Average production per hour, 9 dozen.

## Eyelets for Detachable Buttons (Operation No. 15)

**Standard Equipment:** Eyelet Machine.

Average production per hour, 11 dozen.

## Standard Table of Gauges

No. 1 gauge 3-32 inch.	No. 4½ gauge 1-4 inch.
No. 2 gauge 1-8 inch.	No. 5 gauge 9-32 inch.
No. 3 gauge 5-32 inch.	No. 5½ gauge 3-8 inch.
No. 4 gauge 3-16 inch.	No. 6 gauge 13-32 inch.

For any gauge not shown in above table the following rule will prevail:

### Specify Gauges by 64ths of an inch

For example:—If it is desired to have 1-2 inch space between stitches, the number of the gauge would correspond to the number of the 64ths or 32.

Likewise 3-4 inch width would be 48 gauge.

## Triple Stitched Overall Jackets with Sleeves Set in Tubular Form

We refer the reader to page 46 where the good qualities of the Triple Stitched seam are clearly explained. Obviously, the one point of better appearance should be sufficient inducement for the manufacturer to produce jackets with triple stitched seams.

### Piecing Sleeves (Operation No. 1)

**Standard Equipment:** UNION SPECIAL Three Needle Machine Style 17100 C.

Folder, 23331-9-7-64.

Presser Foot, 17120 D-9.

Feed Dog, 17105 C-10.

Throat Plate, 17124 C-9.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 9 dozen.

Note: This operation can also be accomplished very efficiently on one of our Side Wheel Cylinder machines.

**Standard Equipment:** UNION SPECIAL Three Needle Machine Style 31500 B.

Folder, 23367-9-7-64.

Presser Foot, 31520 B-9.

Feed Dog, 31505 B-10.

Throat Plate, 31524 B-9.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 9 dozen.

### Felling Sleeves in Tubular Form (Operation No. 3)

**Standard Equipment:** UNION SPECIAL Three Needle Machine Style 31500 B.

Folder, 23367-9-7-64.

Presser Foot, 31520 B-9.

Feed Dog, 31505 B-10.

Throat Plate, 31524 B-9.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 9 dozen.

### Stitching Center Back Seam and Two Side Back Seams (Operation No. 7)

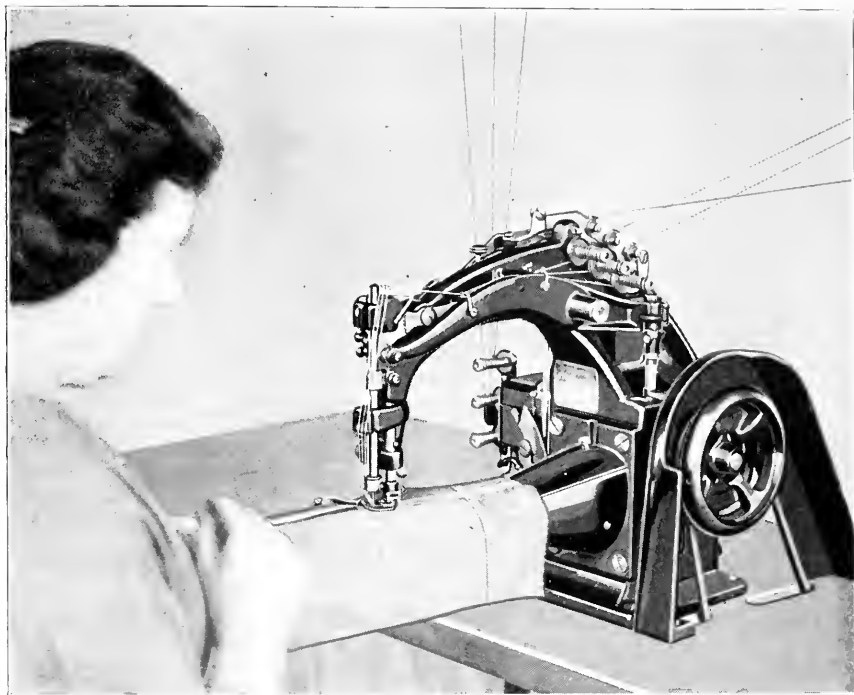
The same equipment is recommended as for operation No. 1.

Average production per hour, 3 dozen.

## Joining Fronts to Back (Operation No. 8)

This operation is done with the same equipment as for operation No. 1.

Average production per hour, 10 dozen.



**Felling Sleeves on 3 Needle Union Special Machine Class 31500.**

## Setting in Tubular Sleeves with Three Rows of Stitches (Operation No. 11)

**Standard Equipment:** UNION SPECIAL Three Needle Machine Style 19100 A-9.

Folder, 23291 G-9-7-64.

Presser Foot, 19120-9.

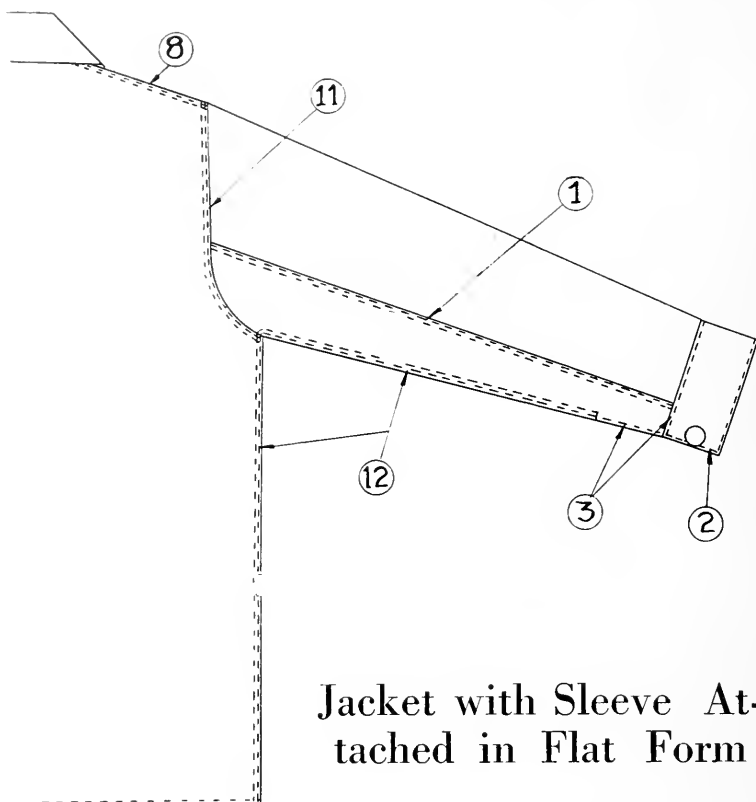
Feed Dog, 19105 A-10.

Throat Plate, 19124-9.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 24 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 2½ dozen.



## Jacket with Sleeve Attached in Flat Form

The coat shown above is made in the same manner as the tubular sleeved jacket with the exception that the sleeves are sewed in flat and closed simultaneously with the side seams in the same manner as in felling shirts.

Due to this difference, the sequence of operations is as follows:

1. Piecing sleeves.
2. Making cuffs.
3. Sewing cuffs to sleeves.
4. Stitching two large and one small pocket to front.
5. Stitching on inside pocket and combination pocket.
6. Stitching facing to front.
7. Stitching center back seam.
8. Joining front and back at shoulder seams.
9. Making collar.
10. Sewing on collars and ticket.
11. Sleeving.\*
12. Felling sleeves and side seams.\*
13. Hemming bottom of body.
14. Tacking.
15. Sewing button-holes.
16. Eyelets for detachable buttons.
17. Attaching buttons.
18. Trimming all loose threads and shaking.
19. Final inspection and folding.

\*Operations 11 and 12 are the only ones that will require any description in addition to that already given for the operations for tubular sleeve jackets.

## Sleeving (Operation No. 11)

This operation consists of attaching the sleeve in flat form to the jacket in the same way as for shirts.

The following helpful hints may be of interest to the operator:

For this operation the sleeve should be held between the second finger and the thumb of the left hand, allowing the sleeve to slip or slide between them, and keeping the edge of the sleeve even with the top of the second finger, and the end of this finger holding the sleeve close to the lower scroll of the folder, and pressing down on the sleeve, holding it tightly between the finger and the flat side of the folder, to slightly retard the sleeve. The body of the garment is held between the first and second fingers, permitting the material to slip or slide freely through the fingers. This leaves the right hand free to assist the body of the garment through the arm of the machine. In making a flat fell, the material next to the feed should always be retarded and the ply next to the presser foot permitted to run through freely. This will give a smooth and slightly finish.

**Standard Equipment:** UNION SPECIAL Two Needle Machine  
Style 7500 B-5.

Note: 4 and 4½ gauge can be had if desired.

Folder, 600-5-7-64.

Presser Foot, 198 A-5.

Feed Dog, 7505.

Throat Plate, 7524 B-5.

Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 7½ dozen.

## Felling (Operation No. 12)

This operation is similar to the operation No. 3 for jackets with tubular sleeves, (see page 55). In addition to closing the sleeve this operation includes closing the sides of the jacket, in the same manner as that used in felling shirts, stitching from cuffs to bottom of jacket.

**Standard Equipment:** UNION SPECIAL Two Needle Machine  
Style 12100 B-5.

Note: 4 and 4½ gauge can be had if desired.

Folder, 601-5-7-64.

Presser Foot, 12120E-5.

Feed Dog, 12105 E-5.

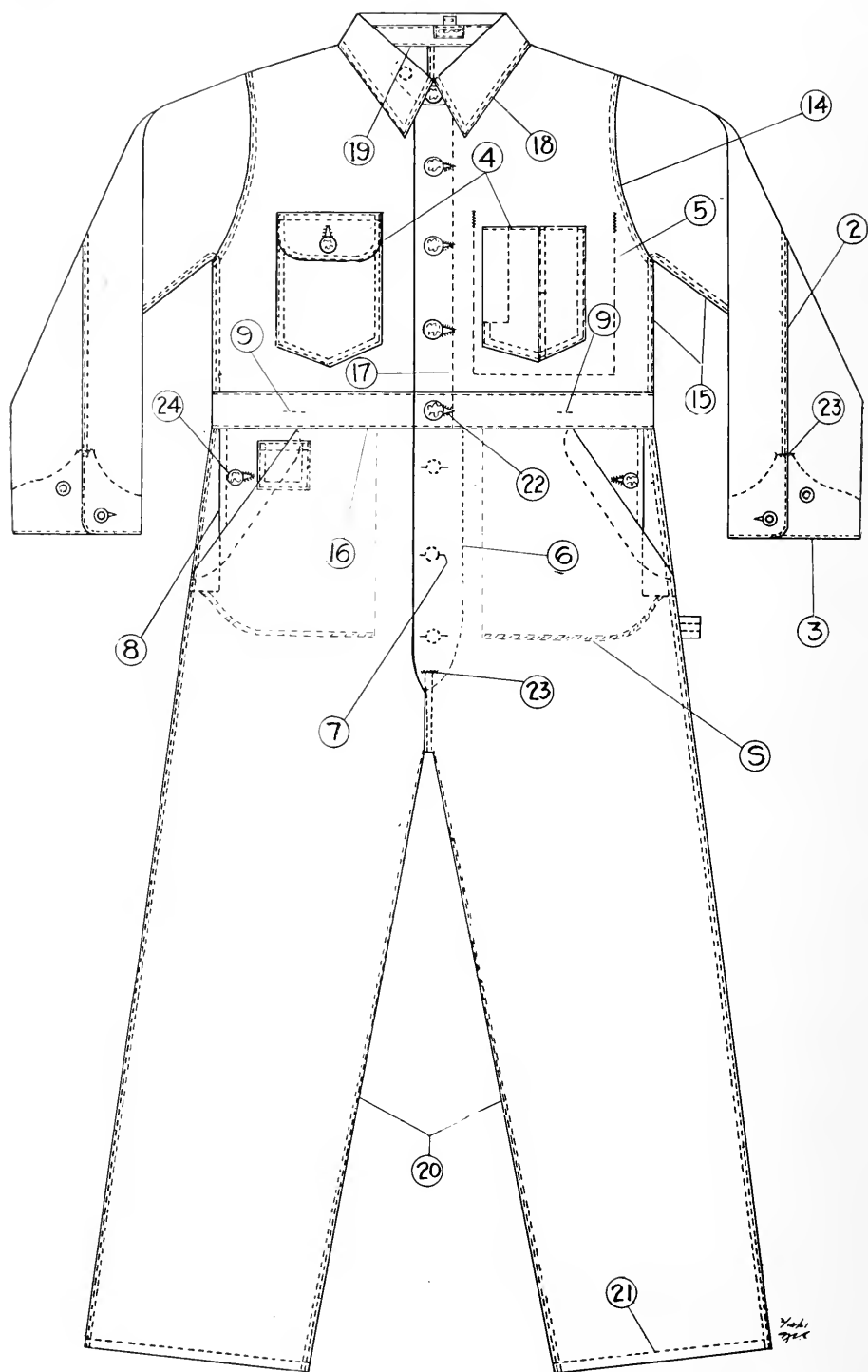
Throat Plate, 12124 E-5.

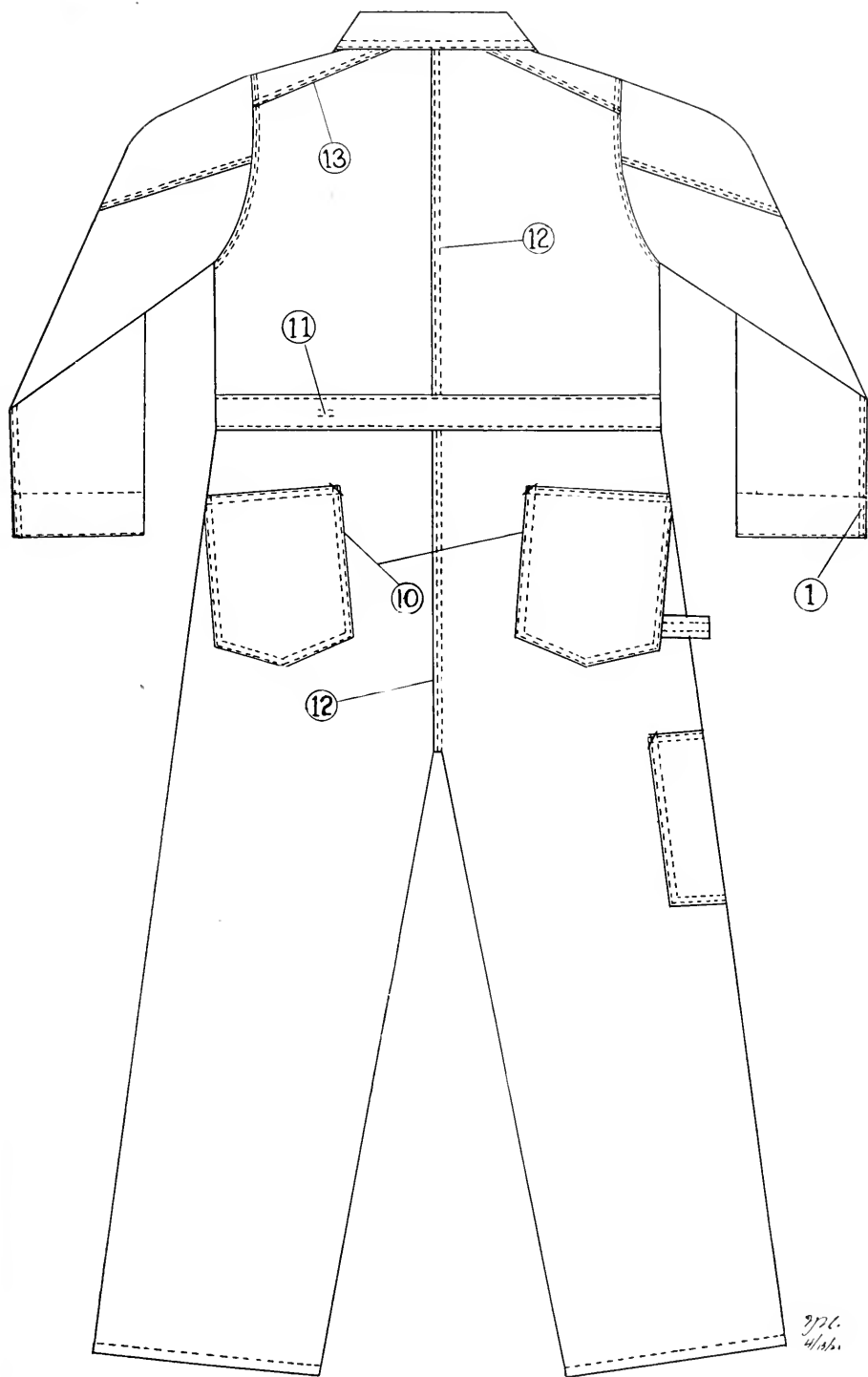
Thread recommended, 3 cord, 24 glazed in needle, 3 cord, 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 5½ dozen.

Note: The principal seams can be triple stitched in the same manner as outlined for jackets with tubular sleeves. See page 60 for description.





3/26.  
4/16.

## List of Operations on Men's Combination Work Garment

1. Stitching under cuff facing.
2. Piecing sleeves.
3. Facing cuffs.
4. Stitching combination and flap pockets to fronts.
5. Stitching one inside pocket to front.
6. Making fly.
7. Sewing fly button-holes.
8. Making and closing front swing pockets and stitching box at top end of fly, etc.
9. Joining top and bottom of each side of front.
10. Stitching hip and rule pockets to back of pants parts.
11. Joining top and bottom of each side of back.
12. Felling center back seam.
13. Joining fronts and backs at shoulder seams.
14. Sleeving.
15. Felling sleeves and side seams.
16. Stitching on band.
17. Hemming for button stay and center plait.
18. Making collar.
19. Stitching on collar.
20. Felling inside leg seams.
21. Hemming bottoms.
22. Sewing button holes.
23. Tacking.
24. Attaching buttons.
25. Trimming loose threads.
26. Final inspection and folding.

Note—Some manufacturers prefer to have one operator do several similar operations which can be done on the same machine. For example, Operations Nos. 11, 12, 13 and 14 can all be done by the same operator.

Likewise Operations Nos. 15 and 20 can be accomplished by the same operator, if desired.





A Modern "Triple Stitched" Combination Garment

## Description of Operations and Equipment for Men's Combination Work Garment

### Stitching under Cuff Facing (Operation No. 1)

See page 72 for Triple Stitching this operation.

This operation consists of stitching that part of the sleeve seam under facing. This permits using a one piece facing and allows the facing to cover the stitched seam, making a more comfortable cuff to the wearer.

**Standard Equipment:** UNION SPECIAL Two Needle Machine Style 7500 B-5. A 4 or 4½ gauge machine can be had if desired.

Folder, 600-5-7-64.

Presser Foot, 198 A-5.

Feed Dog, 7505.

Throat Plate, 7524 B-5.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 20 dozen (about 4 inches of stitching).

Note—This operation can also be done very efficiently on a cylinder machine, giving the same high grade results.

**Standard Equipment:** UNION SPECIAL Two Needle Machine Style 12100 B-5. A 4 or 4½ gauge machine can be had if desired.

Folder, 601-5-7-64.

Presser Foot, 12120 E-5.

Feed Dog, 12105 E-5.

Throat Plate, 12124 E-5.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 20 dozen.

### Piecing Sleeves (Operation No. 2)

See page 73 for Triple Stitching this operation.

This operation consists of stitching the sleeve parts together, starting at the placket.

The same equipment as recommended for operation No. 1 should be used.

Average production per hour, 9 dozen.

### Facing Sleeves for Cuffs (Operation No. 3)

This operation consists of stitching a facing inside the sleeve for cuff.

**Standard Equipment:** Shuttle Stitch Machine.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 24 soft in bobbin.

Number of stitches to the inch, 9.

Average production per hour, 2¼ dozen.

## Stitching Combination and Flap Pockets to Fronts (Operation No. 4)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 24 soft in bobbin.

Number of stitches to the inch, 9.

Average production per hour,  $\frac{3}{4}$  dozen.

## Stitching One Inside Pocket to Front (Operation No. 5)

The same equipment as used for Operation No. 4 is recommended.

Average production per hour, 6 dozen.

## Making Fly (Operation No. 6)

**Standard Equipment:** UNION SPECIAL Machine Style 6500 E. Folder, 23182 D.

Presser Foot, 6427 B.

Feed Dog, 9705.

Throat Plate, 9724 B.

Thread recommended, 3 cord 30 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 40 dozen.

## Sewing Fly Button-Holes (Operation No. 7)

**Standard Equipment:** Button-hole Machine.

## Making and Closing Front Swing Pockets, Joining Parts to Fly, Stitching Box at Top End of Fly (Operation No. 8)

**Standard Equipment:** Shuttle Stitch Machine.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 24 soft in bobbin.

Number of stitches to the inch, 9.

Average production per hour, 1 dozen.

Note—In case it is desired to finish pockets with a serged edge as shown on page 22 this is done in a separate operation.

**Standard Equipment:** UNION SPECIAL Machine Style 15400 Q.

Presser Foot, 15427 G.

Feed Dog, 15405 W.

Throat Plate, 15424 J.

Thread recommended, 3 cord 60 silk finish in needle, 3 cord 50 soft in looper.

Number of stitches to the inch, 11.

Average production per hour, 14 dozen.

## Joining Top to Bottom of Each Side of Fronts (Operation No. 9)

This requires only a single row of stitches as the strain is not so great as that in the back of the garment.

**Standard Equipment:** UNION SPECIAL Single Needle Machine Style 6500 B.

Cloth Plate Gauge 24.

Presser Foot, 6520

Feed Dog, 9205 E.

Throat Plate, 9224 E.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 10 dozen.

## Stitching Hip and Rule Pockets to Pants Parts Including Tool Hanger (Operation No. 10)

The following helpful hints are recommended as an aid to the operator:

The operation is started on the upper right hand corner of the pocket. The material is turned downwardly and inwardly by the operator and is guided by her finger. The bar on the edge of the presser foot is used as a guide for the edge of the pocket. An experienced operator will stitch around the side and bottom of the pocket, including corner, without stopping.

**Standard Equipment:** UNION SPECIAL Machine Style 8300 Z-4.

Presser Foot, 8220 B-4.

Feed Dog, 7205 A.

Throat Plate, 8224-4.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 6 dozen.

## Joining Tops to Bottoms of Each Side of Backs (Operation No. 11)

This consists of seaming the back of pants to the back of jacket. This stitching is not shown on figure, see page 65 as it is covered by band, which is stitched on later.

Note—Operations 11, 12, 13 and 14 can all be done by one operator, if desired.

The same equipment as specified for Operation No. 1 is recommended.

Average production per hour, 12 dozen.

## Felling Center Back Seam (Operation No. 12)

This operation consists of joining the sides of the back together and includes a run from the neck to the crotch.

The same equipment as specified for Operation No. 1 is recommended.

Average production per hour, 8 dozen.

## Joining Fronts and Backs at Shoulder Seams (Operation No. 13)

See page 73 for Triple Stitching this operation.

The same equipment as specified for Operation No. 1 is recommended.

Average production per hour, 20 dozen.

## Sleeving (Operation No. 14)

This operation consists of attaching the sleeves to the body of the garment in flat form, the same as sleeving shirts.

The same equipment as specified for Operation No. 1 is recommended.

Average production per hour, 3 dozen.

## Felling Sleeves and Side Seams (Operation No. 15)

See page 73 for Triple Stitching this operation.

This operation consists of seaming the sleeve into tubular form and continuing the closing of the side seams of the garment running all the way down to the bottom of legs.

**Standard Equipment:** UNION SPECIAL Two Needle Machine Style 12100 B-5.

Note—4 or 4½ gauge can also be had if desired.

Folder, 601-5.

Presser Foot, 12120 E-5.

Feed Dog, 12105 E-5.

Throat Plate, 12124 E-5.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 3½ dozen.

## Stitching on Band (Operation 16)

This operation consists of stitching a strip or band to the body of the combination garment over the joint of top and bottom. This usually is done on the outside of garment as it covers the joining stitches and makes a very neat belt effect.

**Standard Equipment:** UNION SPECIAL Banding Machine Style 16500 Z-80, equipped with pulling mechanism.

Folder, 23295 E-80.

Presser Foot, 16220 B-80.

Feed Dog, 16505-88.

Throat Plate, 16224-80.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 8 dozen.

## Hemming for Button Stay and Center Plait (Operation No. 17)

This operation consists of turning inwardly the edges at center of garment and stitching with a single row of stitches as shown in the accompanying seam construction.

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Average production per hour, 13 dozen.

## Making Collar (Operation No. 18)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 24 soft in bobbin.

Number of stitches to the inch, 9.

Average production per hour, 4 dozen.

## Stitching on Collar (Operation No. 19)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 24 soft in bobbin.

Number of stitches to the inch, 9.

Average production per hour, 10 dozen.

## Felling Inside Leg Seam (Operation No. 20)

See page 73 for Triple Stitching this operation.

This operation consists of stitching the inside seam of legs starting at the bottom of one and running up across crotch and down the other leg to bottom.

**Standard Equipment:** UNION SPECIAL Two Needle Machine Style 12100 B-5.

The same equipment as that specified for operation No. 15 is recommended.

Average production per hour, 5 dozen.

## Hemming Bottoms (Operation No. 21)

**Standard Equipment:** UNION SPECIAL Single Needle Machine, Style 11500 G.

Presser Foot, 11520 H for  $\frac{3}{8}$  or  $\frac{1}{2}$  inch hem.

Feed Dog, 11505 H.

Throat Plate, 11524 H.

Attachment 23364.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 9 dozen.

## Triple Stitched Combination Work Garments

We refer the reader to page 46 where the good qualities of the Triple Stitched seam are clearly explained. Obviously the one point of better appearance should be sufficient inducement for the manufacturer to produce combination garments with triple stitched seams.

## Stitch Under Cuff Facings (Operation No. 1)

**Standard Equipment:** UNION SPECIAL Three Needle Machine, Style 17100 C.

Folder, 23331-9-7-64.

Presser Foot, 17120 B-9.

Feed Dog, 17105 C-10.

Throat Plate, 17124 C-9.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 45 dozen.

Note—This operation can also be accomplished very efficiently on one of our Side Wheel Cylinder Machines.

**Standard Equipment:** UNION SPECIAL Three Needle Machine, Style 31500 B.

Folder, 23367-9-7-64.

Presser Foot, 31520 C-9.

Feed Dog, 31505 B-10.

Throat Plate, 31524 B-9.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 9.

Average production per hour, 45 dozen.

## Piecing Sleeves (Operation No. 2)

Use the same equipment as that specified for Operation No. 1

Average production per hour, 9 dozen.

## Joining Tops to Bottoms of Each Side of Backs (Operation No. 11)

Note—Operations Nos. 11, 12, 13 and 14 can all be done by one operator if desired.

Use same equipment as specified for Operation No. 1.

Average production per hour, 12 dozen.

## Felling Center Back Seams (Operation No. 12)

Use same equipment as specified for Operation No. 1.

Average production per hour, 8 dozen.

## Joining Fronts and Backs at Shoulder Seams (Operation No. 13)

Use same equipment as specified for Operation No. 1.

Average production per hour, 25 dozen.

## Sleeving (Operation No. 14)

Use same equipment as specified for Operation No. 1.

Average production per hour, 2½ dozen.

## Felling Sleeves and Side Seams (Operation No. 15)

**Standard Equipment:** UNION SPECIAL Three Needle Machine, Style 31500 B.

Folder, 23367-9-7-64.

Presser Foot, 31520 C-9.

Feed Dog, 31505 B-10.

Throat Plate, 31524 B-9.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

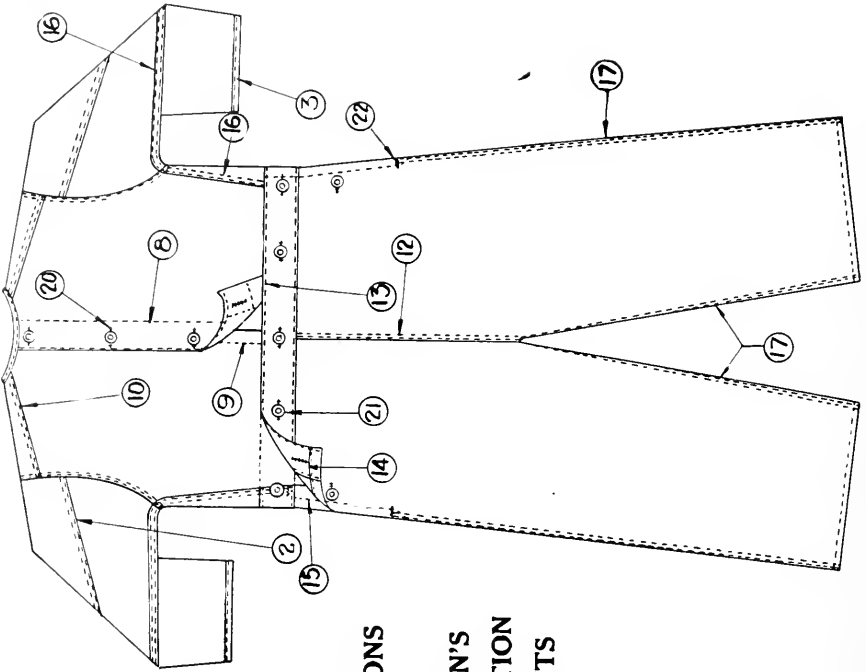
Number of stitches to the inch, 9.

Average production per hour, 3½ dozen.

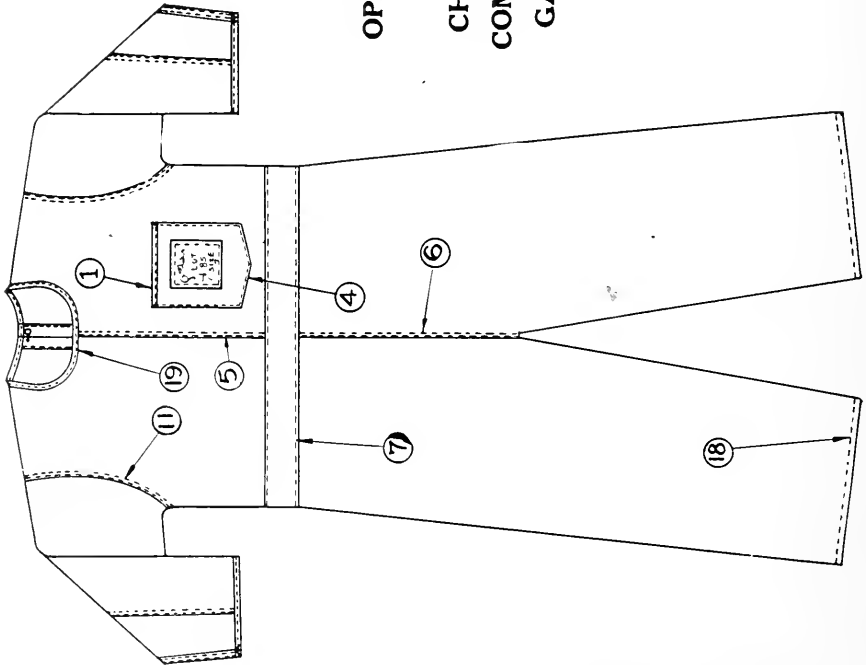
## Felling Inside Leg Seam (Operation No. 20)

Use the same equipment as specified for Operation No. 15.

Average production per hour, 5 dozen.



OPERATIONS  
ON  
CHILDREN'S  
COMBINATION  
GARMENTS





## List of Operations on Children's Combination Garments

1. Stitching red binding to pockets.
2. Piecing sleeves.
3. Stitching red binding to sleeves.
4. Stitching pocket to front.
5. Stitching upper center front seam.
6. Stitching lower center front seam.
7. Stitching on red front band (joining upper and lower parts of garment).
8. Stitching center plait to back.
9. Stitching center button stay.
10. Joining front and backs.
11. Sleeving.
12. Stitching lower center back seam.
13. Stitching on red back band.
14. Hemming sides of backs.
15. Hemming sides of front.
16. Felling from cuff to waist line.
17. Felling in and out seams.
18. Hemming bottoms.
19. Stitching red binding to neck.
20. Sewing button-holes.
21. Attaching buttons.
22. Tacking.
23. Trimming loose threads.
24. Final inspection and folding.
25. Pressing.

# Description of Operations and Equipment For Children's Combination Overall and Jacket

## Stitching Red Binding To Pockets (Operation No. 1)

This operation consists of stitching the strip or binding to tops of pocket parts, including all pockets in a bundle, without stopping. The binding is trimmed while it is being stitched.

**Standard Equipment:** UNION SPECIAL Single Needle Machine Class 15800 A.

Binder, 23322 N- $\frac{3}{4}$ .

Feed Dog, 15805 F.

Presser Foot, 15820 F.

Throat Plate, 15824 C.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 10.

Average production per hour, 45 dozen.

## Piecing Sleeves (Operation No. 2)

This operation consists of stitching a piece to sleeves for economical reasons.

**Standard Equipment:** UNION SPECIAL Two Needle Machine, Style 7500 B-4.

Folder, 600-4-3-32.

Feed Dog, 7405 B-4.

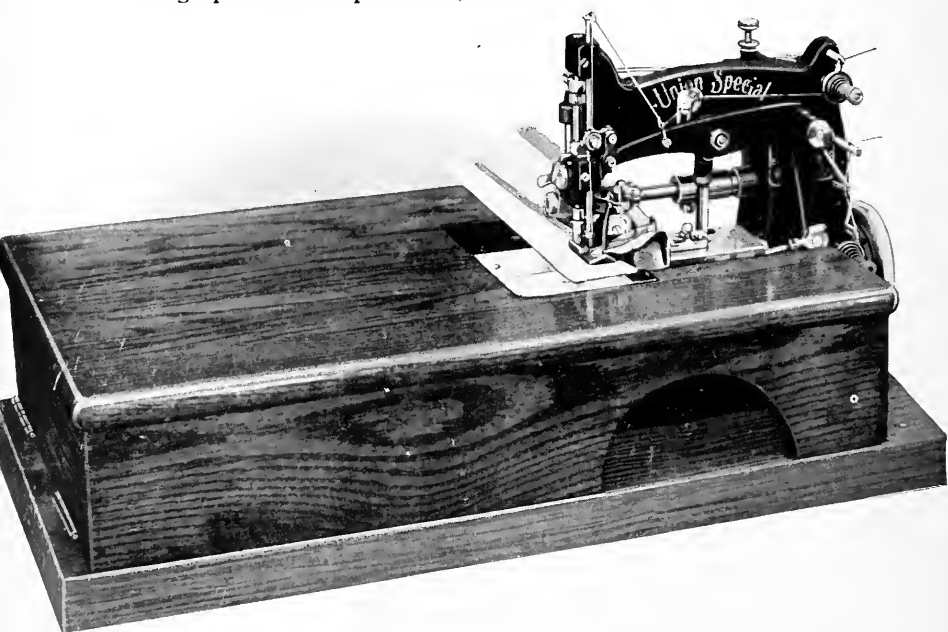
Presser Foot, 198 A-4.

Throat Plate, 7524 B-4.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 10.

Average production per hour, 4 dozen.



STYLE 15800 A.

### Stitching Red Binding To Sleeves (Operation No. 3)

See Operation No. 1 for equipment, etc.

Average production per hour, 25 dozen.

### Stitching Pocket To Front (Operation No. 4)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Number of stitches to the inch, 12.

Thread recommended, 3 cord, 60.

Average production per hour, 12½ dozen.

### Stitching Upper Center Front Seam (Operation No. 5)

This operation consists of joining the two halves of the upper front.

See Operation No. 2 for equipment.

Average production per hour, 30 dozen.

### Stitching Lower Center Front Seam (Operation No. 6)

See Operation No. 2 for equipment.

Average production per hour, 30 dozen.

### Stitching On Red Front Band (Operation No. 7)

This operation consists of folding and stitching the red galatea trimming or band to the front of garment, simultaneously joining the upper and lower part of fronts.

**Standard Equipment:** UNION SPECIAL Two Needle Machine, Style 16500 Z-80, equipped with pulling mechanism.

Folder, 23328 H-80.

Presser Foot, 16220 B-80.

Feed Dog, 16505-80.

Throat Plate, 16224-80.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 10.

Average production per hour, 15 dozen.

### Stitching Center Plait To Back (Operation No. 8)

This operation consists of folding and stitching a strip to back.

**Standard Equipment:** UNION SPECIAL Two Needle Machine. Style 16500 Z-80.

Folder, 23328 H-80.

Presser Foot, 16132-80.

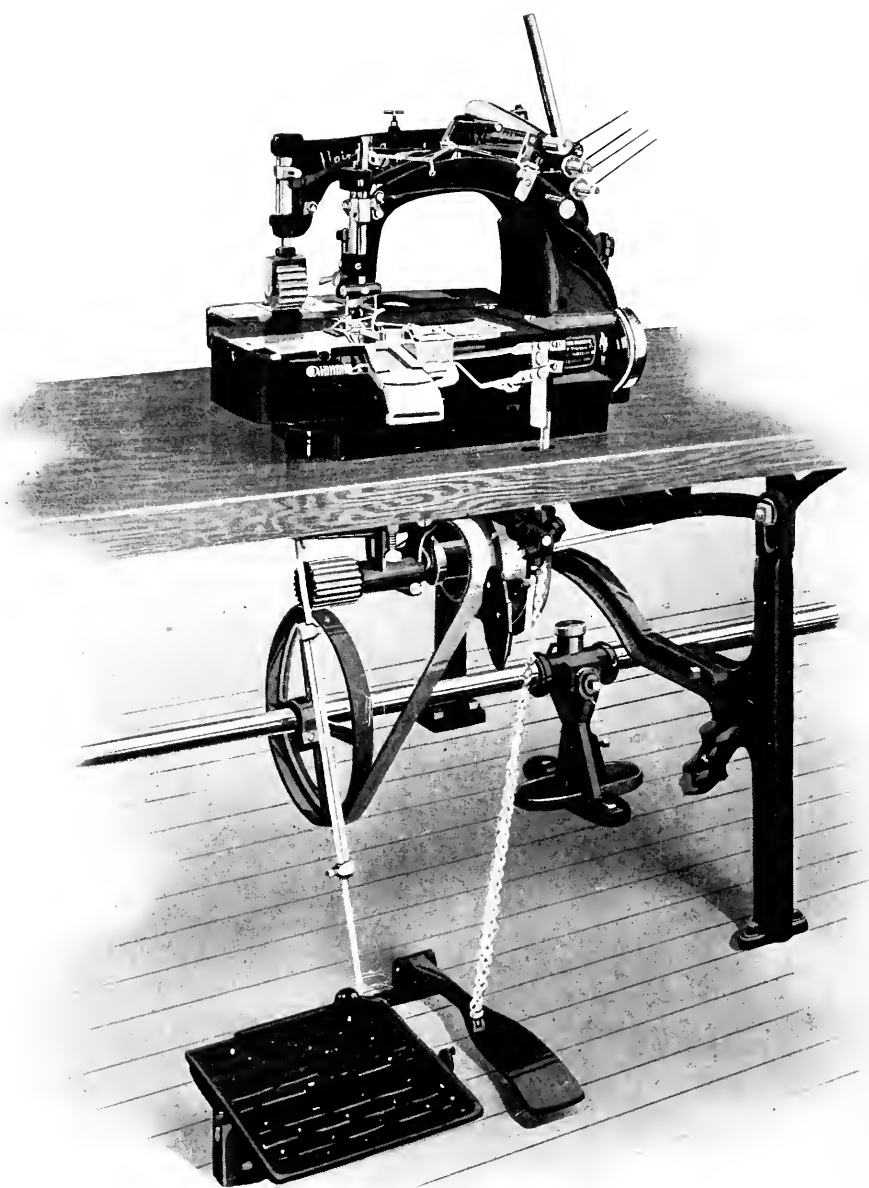
Feed Dog, 16505-80.

Throat Plate, 16224-80.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 10.

Average production per hour, 18 dozen.



UNION SPECIAL MACHINE  
CLASS 16500.  
"READY FOR BANDING"

## Stitching Center Button Stay To Back (Operation No. 9)

**Standard Equipment:** UNION SPECIAL Single Needle Machine Style 6500 B.

Presser Foot, 6520.

Feed Dog, 9205 E.

Throat Plate, 9224 E.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 10.

Average production per hour, 18 dozen.

## Joining Fronts and Backs (Operation No. 10)

See Operation No. 2 for equipment.

Average production per hour, 25 dozen.

## Sleeving (Operation No. 11)

This operation consists of joining the sleeves to the body of garment.

See Operation No. 2 for equipment.

Average production per hour, 6 dozen.

## Stitching Lower Center Back Seam Operation No. 12)

See Operation No. 2 for equipment.

Average production per hour, 30 dozen.

## Stitching On Red Back Band (Operation No. 13)

This operation consists of stitching and folding red galatea band trimming to the outside, band of denim to the inside, and edge of garment between.

**Standard Equipment:** UNION SPECIAL Two Needle Machine Style 16500 Z-80, equipped with pulling mechanism.

Folder, 23295 E-80.

Upper Folder, 23295 E-80.

Lower Folder, 23293 D-80.

Presser Foot, 16132-80.

Feed Dog, 16205-88.

Throat Plate, 16224-80.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 10.

Average production per hour, 15 dozen.

## Hemming Sides Of Backs (Operation No. 14)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Number of stitches to the inch, 10.

Average production per hour, 25 dozen.

## Hemming Sides Of Fronts (Operation No. 15)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.  
Average production per hour, 25 dozen.

## Felling From Cuff To Waist Line (Operation No. 16)

This operation consists of joining the sleeve in tubular form and simultaneously joining sides of coat portion of garment.

**Standard Equipment:** UNION SPECIAL Two Needle Machine  
Style 12100 B-4.

Folder, 601-4- 7-64.

Presser Foot, 12120 E-4.

Feed Dog, 12105 E-4.

Throat Plate, 12124 E-4.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 10.

Average production per hour, 8 dozen.

## Felling In And Out Seam (Operation No. 17)

See Operation No. 16 for equipment.

Average production per hour, 3 dozen.

## Hemming Bottoms (Operation No. 18)

**Standard Equipment:** UNION SPECIAL Single Needle Machine  
Style 11500 G, making a narrow, slightly hem.

Presser Foot, 11520 H for  $\frac{3}{8}$  or  $\frac{1}{2}$  inch hem.

Feed Dog, 11505 H.

Throat Plate, 11524 H.

Thread recommended, 3 cord 24 glazed in needle, 3 cord 36 soft in looper.

Number of stitches to the inch, 10.

Average production per hour, 12 dozen.

## Stitching Red Binding To Neck (Operation No. 19)

See Operation No. 1 for equipment.

Average production per hour, 18 dozen.

## Sewing Button-Holes (Operation No. 20)

**Standard Equipment:** Button-hole Machine.

Average production per hour, 625 holes.

## Attaching Buttons (Operation No. 21)

**Standard Equipment:** Button Machine.

Average production per hour, 870 Buttons.

## Tacking (Operation No. 22)

**Standard Equipment:** Tacking Machine.

Average production per hour, 500 tacks.

## List of Operations On Khaki Trousers

1. Making fly.
2. Button-holes in fly.
3. Making and attaching 2 swing pockets, 1 back pocket, and 1 watch pocket and stitching two sides of front together at crotch.
4. Seaming and welting outside seams.
5. Seaming seat seams.
6. Seaming Inside Seams.
7. Hemming for cuffs.
8. Making belt loops.
9. Attaching inside band to top of trousers.

## Description of Operations and Equipment For Making Khaki Trousers

### Making Fly (Operation No. 1)

**Standard Equipment:** UNION SPECIAL Machine Style 6500 E. Folder, 23182 D.

Presser Foot, 6427 B.

Feed Dog, 9705.

Throat Plate, 9724 B.

Thread Recommended, 3 cord 40 soft finish in needle, 3 cord 50 soft in looper.

Number of stitches to the inch, 12.

Average production per hour, 40 dozen.

### Fly Button-Holes (Operation No. 2)

**Standard Equipment:** Button-hole machine.

Average production per hour, 15 dozen.

### Making and Attaching Two Swing Pockets, One Back Pocket, and One Watch Pocket, Stitching Two Sides of Fronts Together At Crotch (Operation No. 3)

**Standard Equipment:** Single Needle Shuttle Stitch Machine.

Average production per hour,  $\frac{3}{4}$  dozen.

Note—In case it is desired to finish pockets in the manner shown on page 22, this is done in a separate operation.

**Standard Equipment:** UNION SPECIAL Machine Style 15400 Q.

Presser Foot, 15427 G.

Feed Dog, 15405 W.

Throat Plate, 15424 J.

Thread Recommended, 3 cord 60 silk finish in needle, 2 cord 50 soft finish in looper.

Number of stitches to the inch, 13.

Average production per hour, 9 dozen.

The above equipment can also be used for serging flies if this is desired.

## Seaming and Welting Outer Seams (Operation No. 4)

This operation consists of seaming and simultaneously welting the outside seams and finishing pockets, etc.

**Standard Equipment:** UNION SPECIAL Single Needle Machine Style 6500 C.

Folder, 23184.

Throat Plate, K 33866.

Presser Foot, K 33868

Feed Dog, K 33867.

Thread Recommended, 3 cord 40 soft in needle, 3 cord 50 soft in looper.

Number of stitches to the inch, 13.

Average production per hour, 2 dozen.

## Seaming Seat Seams (Operation No. 5)

**Standard Equipment:** UNION SPECIAL Machine Style 6500 B.

Presser Foot, 6520.

Feed Dog, 9205 E.

Throat Plate, 9224 E.

Thread recommended, 3 cord 40 soft in needles, 3 cord, 50 soft in looper.

Number of stitches to inch, 12.

Average production per hour, 16 dozen.

## Seaming Inside Seams (Operation No. 6)

See Operation No. 5 for equipment.

Average production per hour, 10 dozen.

## Hemming for Cuffs (Operation No. 7)

**Standard Equipment:** UNION SPECIAL Machine Style 11500 Z.

No attachments. Other adjusting parts same as 11500 G.

Thread recommended, 3 cord 40 soft in the needle, 3 cord 50 soft in the looper.

Average production per hour, 50 dozen.

Number of stitches to the inch, 12.



## Making Belt Loops (Operation No. 8)

**Standard Equipment:** UNION SPECIAL Machine Style 6900 H.

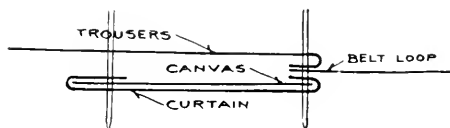
This machine will accommodate belt loops cut in short lengths.  
Furnished in 12 and 16 gauges.

Thread recommended, 3 cord 40 soft in the needle, 3 cord 50 soft in the looper.

Number of stitches to the inch, 13.

Average production per hour, 21 dozen.

## Attaching Inside Band To The Top Of Trousers. Simultaneously Attaching Top End Of Loop (Operation No. 9)



**Standard Equipment:** UNION SPECIAL Two Needle Machine Style 16500 Z-80 gauge. Equipped with pulling mechanism.

Folder, K-27992.

Presser Foot, 16220 B-80.

Feed Dog, 16505-80.

Throat Plate, 16224-80.

Thread Recommended, 3 cord, 40 soft in the needle, 3 cord, 50 soft in the looper.

Number of stitches to the inch, 12.

Average production per hour, 33 dozen.

## Standard Table of Gauges

No. 1 gauge 3-32 inch.

No. 2 gauge 1-8 inch.

No. 3 gauge 5-32 inch.

No. 4 gauge 3-16 inch.

No. 4½ gauge ¼ inch.

No. 5 gauge 9-32 inch.

No. 5½ gauge 3-8 inch.

No. 6 gauge 13-32 inch.

For any gauge not shown in above table the following rule will prevail:

### Specify Gauges by 64ths of an inch

For example:—If it is desired to have ½-inch space between stitches, the number of the gauge would correspond to the number of the 64ths or 32.

Likewise ¾-inch width would be 48 gauge.

# Comparative Test of Stitches and Seams

EXTRACT FROM TECHNOLOGIC PAPER OF THE UNITED  
STATES GOVERNMENT BUREAU OF STANDARDS,  
NO. 96, ISSUED JUNE 25, 1917.

## Tensile Strength of Seams

Test specimens 1 inch wide, 3 inches between jaws of testing machines.

### 12-ounce Wool Uniform Cloth

Stitch Employed and Size of Threads Used	Seam Tests	One Stitching Thread Cut at Center of Specimen	Loss in Strength by Cutting of Stitching Thread
Shuttle Stitch	Pounds	Pounds	Per Cent
No. 36 upper thread, No. 36 under thread . . . . .	11.2	3.5	68.7
Double-Locked Stitch:			
No. 36 upper thread, No. 36 under thread . . . . .	23.7	23.7	None
No. 36 upper thread, No. 70 under thread . . . . .	23.8	22.1	Practically None
No. 36 upper thread, No. 80 under thread . . . . .	24.2	22.8	Practically None

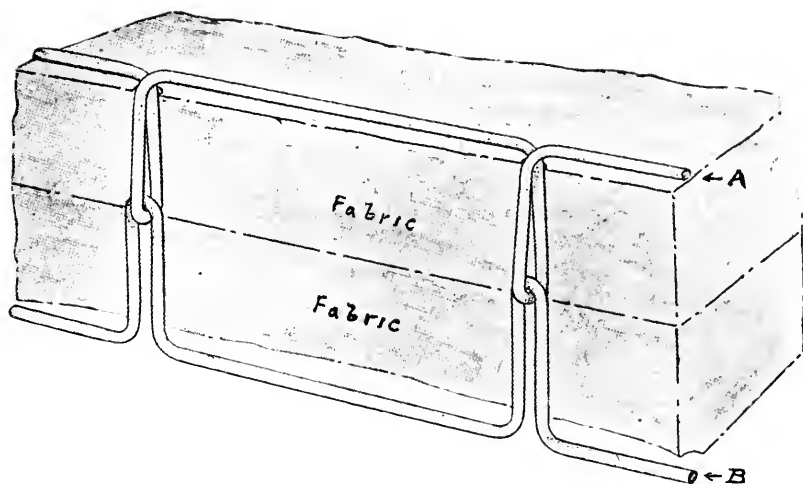
—"IT IS INTERESTING TO NOTE THAT EVEN THOUGH THE DOUBLE LOCKED SEAM WAS CUT OR BROKEN, IT WAS STILL STRONGER THAN THE UNCUT SEAM OF THE SHUTTLE STITCH." (Page 4, Paper 96.) U. S. Bur. of Stand.

Remember: The words "Double-Locked Stitch" and Union Special are synonymous.

## The Double Locked Stitch

Daily experience emphasizes the fact that the question of stitch is one of vital importance both to the manufacturer and the consumer. There are three distinct types of stitches: namely, (1) the chain stitch, (2) the shuttle stitch, (3) the Double Locked stitch, or the Union Special stitch.

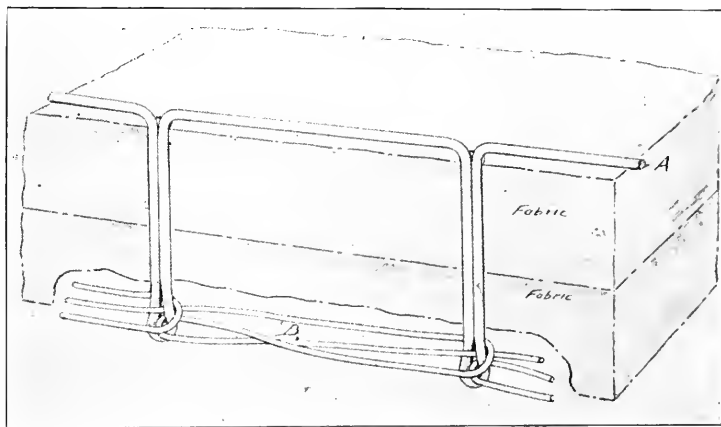
Upon examining the chain stitch we find it is formed of a single thread, one stitch being looped into another consecutively, the name being derived from the appearance of the under side of the stitch which resembles the links of a chain. This stitch may be used where there is little or no wear on the stitch. The weakness, as can readily be seen, lies in the fact that if a stitch is broken or the machine skips a stitch, all the stitches preceding it will unlock, one after another, and the seam with little or no strain applied to it, will come apart. This stitch is used to a small extent as compared with the other types.



### Shuttle Stitch

The shuttle stitch shown above is sometimes called the plain stitch and often spoken of as the lock stitch, though erroneously, because it in no way locks, for if one stitch is cut, the seam is weakened as the threads will easily ravel back at least a short distance, causing the seam to open. Hence, this stitch will be spoken of as the shuttle stitch, it being the stitch formed exclusively by means of employing a shuttle and bobbin.

In examining the formation of the shuttle stitch we find it is a two-thread stitch composed of an upper thread called the needle thread and an under thread called the bobbin thread, the essential features of construction being that the bobbin thread is carried entirely through the extended loop of the needle thread thus placing or lapping the threads, one over the other, causing the two threads to act directly one against the other.



### Double Locked Stitch

In the DOUBLE LOCKED stitch, or UNION SPECIAL stitch shown above, we note an upper thread called the needle thread and

an under thread called the looper thread. The formation of the stitch is accomplished by the looper thread looping once DOUBLY through the needle thread loop and once around it. In this manner, the looper thread engages the needle thread TWICE every stitch. This peculiar formation prevents a slipping, loosening, or chafing of one thread against the other and not only in name, but in FACT, locks the stitch so that if one stitch is cut, there will be no raveling back or opening of the seam, and no weakening of it. This was conclusively proved in tests carried out by the United States Government. See page 84.

Due to the fact that a shuttle is employed in making the shuttle stitch, the needle thread must pass through the eye of the needle many times in every inch of stitching while in the machines producing the Double Locked Stitch, a reciprocating eye pointed finger or LOOPER is employed, which necessitates the passage of the thread but once through the eye of the needle. Thus the thread is laid in the fabric without any impairment. This is impossible where a bobbin is used as the thread must pull through the needle several times before entering the fabric. After the thread is embedded in the fabric in the case of the shuttle stitch, the strength of the seam must necessarily be that of the weaker thread minus the weakening caused by the seesaw action of the thread and chafing due to the tendency of one thread to sever the other.

In the Double Locked Stitch the double engagement of threads at the point of joining obviates the direct action of one thread against the other when a strain is applied, thus the Double Locked Stitch has two distinct advantages over the shuttle stitch as regards the tensile strength (pulling strength) of the thread in that there is no chafing due to the thread being drawn several times through the needle and no chafing due to one thread acting directly on the other when a strain is applied.

As to the consumption of thread, while a shuttle machine may use less thread to a yard of stitching, yet it is a well recognized principle that the greater the amount of thread in the formation of a stitch, the greater the elasticity. Again, the Double Locked Stitch uses an under thread from two to three sizes smaller than the needle thread which as far as cost is concerned, compensates for the greater amount of thread used. Further, with the shuttle stitch there is experienced a loss of thread when every bobbin runs out and in rewinding bobbins oftentimes they are wound defectively and the operator must cut the thread from them, thus losing all the thread on that bobbin, whereas in the Double Locked Stitch machines, the thread is drawn directly from the spools or cones. When everything is considered, the greater amount of thread used in the formation of the Double Locked Stitch is more than compensated for by the use of a smaller under thread and elimination of all waste which is incident to the use of bobbins.

When the fact is taken into consideration that a bobbin contains but a very small amount of thread and must be refilled many times during the day, it will be readily appreciated that there is immense saving in the use of Union Special Machines by taking the thread directly from the spools or cones and eliminating all the time consumed in handling the bobbins.

Another source of loss to the manufacturer is through seconds. If an operator makes a mistake or if say, the folder becomes displaced and leaves a raw edge and it is necessary to open the seam in case a shuttle stitch is used, at least every third thread must be cut and the pieces of thread removed from the fabric, whereas if a machine making the Double Locked stitch were employed, the operator has merely to unlock the stitch at one end, an extremely simple operation, and then draw the threads from the fabric, thus eliminating any possible chance of injuring the goods as is the case with the shuttle stitch. The question might properly arise in one's mind that if the stitch can be unlocked and easily raveled, will it not do so of its own accord when a stitch is broken. The answer is emphatically, NO! The reason is that due to the formation of the stitch there is no possibility of the stitch becoming unlocked, whether broken or not. In other words, an outside agency must unlock the stitch thus eliminating all possible chance of the stitch becoming opened and then raveling due to wear, washing, cutting or breaking. To any statement to the effect that the ability to unravel the Union Special stitch when needed, is a detriment, we answer that our stitch might be likened to the combination of a safe—it can only be opened if you **know** the combination.

Thus we find that the Double Locked stitch has many advantages over the shuttle stitch, namely, there is no chafing of one thread by the other and no chafing of one thread against the other after being applied to the fabric. If a stitch is broken there is no resultant opening of the seam as in the case of the shuttle stitch, the seam is of greater elasticity and responds to strain without breaking. Damage to goods likely to result from ripping out the stitch is entirely eliminated by the use of the Double Locked stitch. Cost of production is reduced because the thread is taken directly from the spools or cones, eliminating all loss of operator's time in handling bobbins. As to comparative strength of the two seams, the test on page 84 made by the United States Government speaks for itself. On June 24, 1917, the Bureau of Standards of the U. S. Department of Commerce, issued technologic paper No. 96 in which is set forth the relative merits of the shuttle stitch and the Double Locked stitch, stating, "Tests made with a variety of fabrics, thread sizes, and types of test specimens have shown that seams made with the Double Locked stitch are stronger and are less weakened by thread breaks than seams made with the shuttle stitch."

Everything considered there can be no doubt that the Double Locked stitch is the ideal stitch to be employed in the manufacture of shirts whether high grade silk shirts or work shirts, for in silk shirts elasticity is desired, and in work shirts great strength is needed.



### Home of Union Special Machine Co.

400 N. Franklin St.,  
Chicago, U. S. A.

When in Chicago, make it a point to visit our Factory and Display Room, located close to the center of town.

By using the key to Railroad Stations and Prominent Hotels given on opposite page, you can estimate the distance any of these are from our factory. For example, the Hotel LaSalle (A) at LaSalle and Madison Sts., is only  $\frac{1}{2}$  mile from our front door.

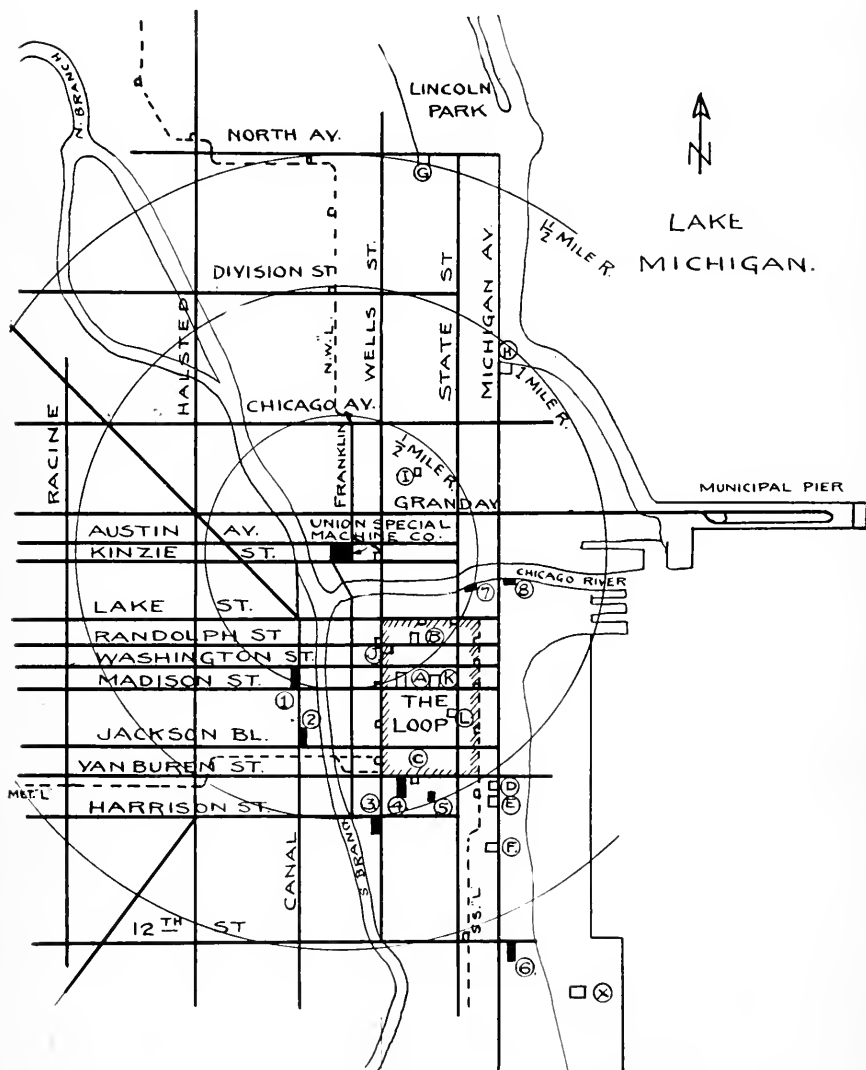
**RAILROAD STATIONS**—1. Chicago & North Western; 2. Union Station; 3. Grand Central; 4. LaSalle St. Station; 5. Polk St. Station; 6. Illinois Central; 7. Graham & Morton Steamers; 8. Goodrich Steamers.

**HOTELS**—A. La Salle; B. Sherman; C. Fort Dearborn; D. Auditorium; E. Congress; F. Blackstone; G. Plaza; H. Drake; I. Virginia; J. Randolph; K. Morrison; L. Palmer House.

X. New Field Museum.

# MAP SHOWING LOCATION OF UNION SPECIAL MACHINE COMPANY'S MAIN OFFICE, FACTORY AND DISPLAY ROOMS

"Six Minute's Walk from the Loop."



### WATCH YOUR STITCH!

See that it is "Double Locked."

See that the proper threads are used.

Use a small thread in the looper.

A small looper thread makes the strongest seam.

A small looper thread makes an attractive seam.

A small looper thread cuts your cost figures.

In a Union Special, there are no bobbins to wind,

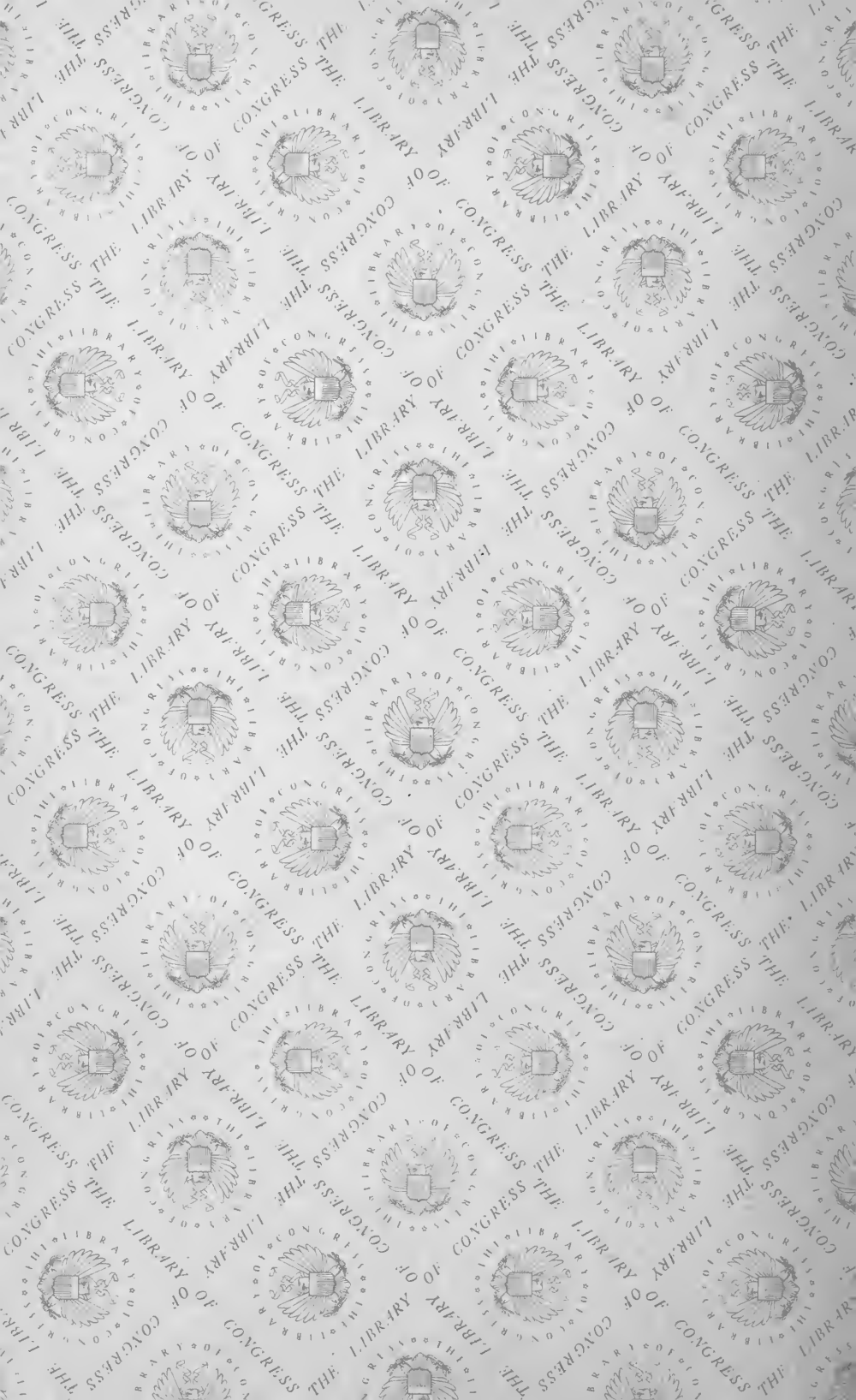
Union Special Machines are Quality  
Machines.













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